

UNCLASSIFIED

AD NUMBER
ADB236178
NEW LIMITATION CHANGE
TO Approved for public release, distribution unlimited
FROM DISTRIBUTION: FURTHER DISSEMINATION ONLY AS DIRECTED BY U.S. ARMY ARMOR CENTER AND FORT KNOX, FORT KNOX, KY 40121-5000 [JUN 98] OR HIGHER DOD AUTHORITY.
AUTHORITY
Robert Cameron, Armor Center Historian, Plans, Operations and Training Div., Fort Knox, KY.

THIS PAGE IS UNCLASSIFIED

United States Army Armor Center
and Fort Knox

1996 Annual Command History

Jun 98
DISTRIBUTION STATEMENT F: Further dissemination only as directed by US Army Armor
Ctr. and Ft. Knox, Ft. Knox, KY authority. or higher DoD

40121-5000



Dr. Robert S. Cameron

11 March 1998

19980622 152

**United States Army Armor Center
and
Fort Knox**

1996 Annual Command History

Dr. Robert S. Cameron

11 March 1998

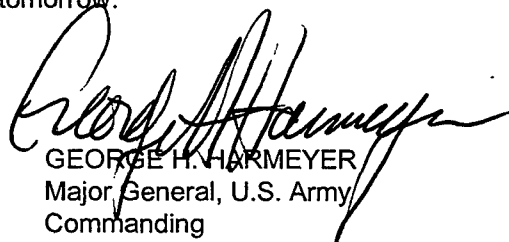
COMMANDER'S INTRODUCTION

Downsizing and its impact dominated Army activities in the year 1996. The Army continued to grapple with an expanding mission spectrum, overseas deployments, digitization, and shrinking resources. While the year opened with the promise of stabilizing the Army's end strength, the year closed with uncertainty regarding the future. The announcement of the Quadrennial Review accounted for much of this uncertainty, sending senior planners once again to balance a shrinking Army against American global interests. Concern over sexual harassment in the Army also emerged in the wake of events at Aberdeen Proving Grounds. The ensuing scandal distracted public attention away from modernization needs.

Amid the changes of 1996 the Armor Center continued to stride forward into the 21st Century. The future battlefield will be one in which technology plays a key role. Consequently, the Armor Center worked to mature those technologies likely to benefit the soldier the most. It supported preparations by the Experimental Force for the upcoming TF XXI Advanced Warfighting Experiment at the National Training Center. Even as it continued to develop the M1A2 and its related training packages, the Armor Center began design work on the Future Combat System and Future Scout and Cavalry System.

Continuous technological advances coupled with a smaller Army, however, underscored the importance of people. Far from eliminating the need for a human touch, the march of technology in 1996 often increased the demands on people both in and out of uniform. It is important to remember that even in this age of high tech, people rather than machines continue to represent the most important asset of the Army. Machinery cannot replace human spirit and innovation. Consequently the Armor Center's mission of training soldiers and developing the doctrine and matériel for them to use will remain vital to the Army.

Pride begins in and depends upon history. Our sense of pride comes from what we have done. While daily events seem sometimes too random and chaotic to have much meaning, they are part of a larger picture. This command history tries to show this larger picture, indicating why and how things happened. Telling that story lets the people who lived it see the greater impact and value of what they did. That knowledge generates pride and helps prepare for the next set of changes. The dynamism that surrounds Fort Knox ensures that it will always be moving forward with spirit and elan to meet the challenges of tomorrow.



GEORGE H. HARMEYER
Major General, U.S. Army
Commanding

PREFACE

The Army History Program became a major part of the Army's institutional memory during World War II. During that conflict the Army began compiling a detailed chronicle of its actions and the rationale for its decisions. This record was to "... give an account of what was done from the point of view of the command preparing the history, including a candid, and factual account of difficulties, mistakes recognized as such, ... the measures used to overcome them, and the effectiveness of such measures." As initially envisioned the History Program would feed the lessons learned process and help the Army grow. This intent continues to drive the Army History Program today, and it is embodied in the following pages.

Command histories possess several intrinsic values. Not only do command histories represent legal public records of activities, they also serve as a reference, feeding current and future activities. Command histories capture information to support or protect the command in the future. Moreover, a sound, readable history increases knowledge within and beyond the command of key events, trends, and forces driving decisions.

The 1996 Annual Command History provides an overview of key activities within the Armor Center and links them with broader trends within the military establishment. It is primarily based upon sources provided by organizations on post, the author's notes from interviews conducted and briefings attended, and a review of pertinent Army publications. The depth and breadth of analysis partially reflects the availability of source material that in some cases was unavailable. However, responsibility for the final presentation lies with the author alone.

TABLE OF CONTENTS

Commander's Introduction	ii
Preface	iii
Chapter 1: The Army in Review	1
Transitioning to a Post Cold War Army	2
Transition Turbulence in 1996	7
Future Expectations	12
Threats to Future Expectations	16
Chapter 2: A Waypoint in the Future: Reengineering the Armor Center and Fort Knox	18
A Vision for Fort Knox	19
Connectivity	21
Fiscal Management	23
Personnel Management	27
Total Army Quality and Army Performance Improvement Criteria	29
Salt River Country Strategic Plan	31
The Commander's Perception of Success	32
A New Commander, A New Vision	33
Chapter 3: BASOPS: Coping With Change	35
Reorganization	36
A Hierarchy of Excellence	38
Reducing the Functions of the Civilian Work Force	42
Automation	44
Quality of Life	45
Human Resource Issues	50
Law and Order	54
Protecting the Environment	57
Financing Change	59
Chapter 4: Training and Training Support	62
TRADOC and Training Development	63
Force XXI Training Program	65
Close Combat Tactical Trainer	68
Classroom XXI and Distance Learning Initiatives	69
Automation and Digitization	70
Active and Reserve Component Integration	71
Fort Knox's Virtual Reality	75
Training Developments	79
Ranges and Training Facilities	82
MOS Consolidation	86
Foreign Military Training	87

Chapter 5: Doctrinal Development	89
Creation of Directorate of Training and Doctrine Development	90
Digitization of Doctrine	92
Doctrinal Overview	94
Cavalry Doctrine	96
The Cavalry Symposium	97
<u>FM 17-95: Cavalry Operations</u>	99
Reconnaissance Symposium	101
Armor Doctrine	103
 Chapter 6: Force Development	 106
Modernization	107
Modernization Strategy	108
Armor Modernization	112
Tank Modernization Plan	114
Armor Center Support for Tank Modernization	121
Implementing Tank Modernization	125
Future Scout and Cavalry System	127
Battle Command	128
Command and Control Vehicle	129
Organizational Development	130
 List of Acronyms	 132
 Index	 139

LIST OF FIGURES

Chapter 1: The Army in Review

Figure 1.1: Army Personnel—Military & Civilian by Fiscal Year, 1985-1996	3
Figure 1.2: Service Percentage of Budget Authority, FY80-FY96	5
Figure 1.3: Army Budget, FY85-FY96 (Constant \$)	6
Figure 1.4: Army Personnel Trends	9
Figure 1.5: Active Military Strength	10
Figure 1.6: Army RDTE Funding Compared to Total	13

Chapter 2: A Waypoint in the Future: Reengineering the Armor Center and Fort Knox

Figure 2.1: General Maggart's Goals	20
Figure 2.2: Hot Loop XXI Funding Sources	24
Figure 2.3: General Harmeyer's Goals	34

Chapter 3: BASOPS: Coping With Change

Figure 3.1: The Directorate of Human Resources	39
Figure 3.2: The Directorate of Business Operations	40
Figure 3.3: A Hierarchy of Excellence	41
Figure 3.4: AFTB Expansion of Activity	48
Figure 3.5: Punitive Actions Against Soldiers	56
Figure 3.6: FY 1996 and FY 1997 Appropriations	59

Chapter 4: Training and Training Support

Figure 4.1: Warrior XXI Initiatives	64
Figure 4.2: Distribution of Training Time	67
Figure 4.3: Changing the National Guard Force Structure	72
Figure 4.4: The Cost of a Higher National Guard OPTEMPO	73
Figure 4.5: Principal Armor Center Simulation Assets	75
Figure 4.6: Recent Virtual Training Program Usage	77
Figure 4.7: 16 CAV Vehicle OPTEMPO	82
Figure 4.8: 1996 Range Usage	83
Figure 4.9: Foreign Military Training in 1996	88

Chapter 5: Doctrinal Development

Figure 5.1: Directorate of Training and Doctrine Development	91
Figure 5.2: Major Cavalry Products in 1996	96

Chapter 6: Force Development

Figure 6.1: Current DoD Outsourcing for Principal Activities	110
Figure 6.2: Ongoing Upgrades to the M1A1	115
Figure 6.3: Mid-Term M1A1 Upgrades	116
Figure 6.4: Possible Future M1A1 Upgrades	116
Figure 6.5: M1A2 Features	118
Figure 6.6: M1A2 SEP Features	119
Figure 6.7: Mid-Term M1A2 Improvements	119
Figure 6.8: Intended FCS Capabilities	121
Figure 6.9: Principal MMBL Experiments of 1996	124

CHAPTER 1 SYNOPSIS

This chapter provides a general overview of significant developments within the Army during 1996. These key trends provide the context for analysis in the subsequent chapters of specific activities within the U.S. Army Armor Center, permitting a linkage between post-level developments and the broader Army vision.

CHAPTER 1: THE ARMY IN REVIEW

The year 1996 opened with American soldiers continuing peacekeeping efforts in Bosnia as part of an international force, trying to ensure that fragile peace between feuding ethnic groups remained in effect. Their presence symbolized America's efforts to adapt to a changing world, destabilized by the collapse of the Soviet Union. While the Cold War's end eliminated the threat of instantaneous global conflict, it encouraged the emergence of regional threats. The simultaneous downsizing of the American military complicated defense planning. The national leadership struggled to keep pace with the political changes happening worldwide and restructure its shrinking military resources to conduct an expanding array of global missions at short notice. The year opened with the Army's transition to a post Cold War stance apparently nearing a conclusion, but the challenges of restructuring the institutional army, ongoing digitization efforts, and the pending Quadrennial Review all created an atmosphere of constant flux unrelieved by a sexual harassment scandal that focused public scrutiny upon the Army's controversial gender integration policy.

Transitioning to a Post Cold War Army

The Cold War's end prompted Congress to review its national defense strategy and determine how the military should be restructured to meet the world's changed geopolitical climate. Known as the "Bottom-Up Review," this 1993 study noted a change in the nature of the military threat to the nation. The proliferation of nuclear, biological, and chemical weapons coupled with the emergence of regional conflicts replaced the threat of massive global nuclear and conventional assault upon American national interests.¹ In trying to prevent the spread of regional conflicts, the Army found itself conducting an increasing number of humanitarian and peace operations throughout the world, symbolized by Operation Joint Endeavor, the largest such operation to date.

The recommendations of the Bottom-Up Review provided the guidelines for the Army's downsizing, and they reflected a public and political desire to redirect funding from national defense to social programs. In the changing geopolitical climate, a smaller but more lethal and efficient military was considered the best means of coping with the changing military threat and reducing defense spending.² The recommendations of the Bottom-Up Review therefore resulted in the Army's reduction to ten divisions and an active component strength of 495,000 men by FY 96.³ Corresponding decreases occurred in the civilian workforce, illustrated in Figure 1.1.

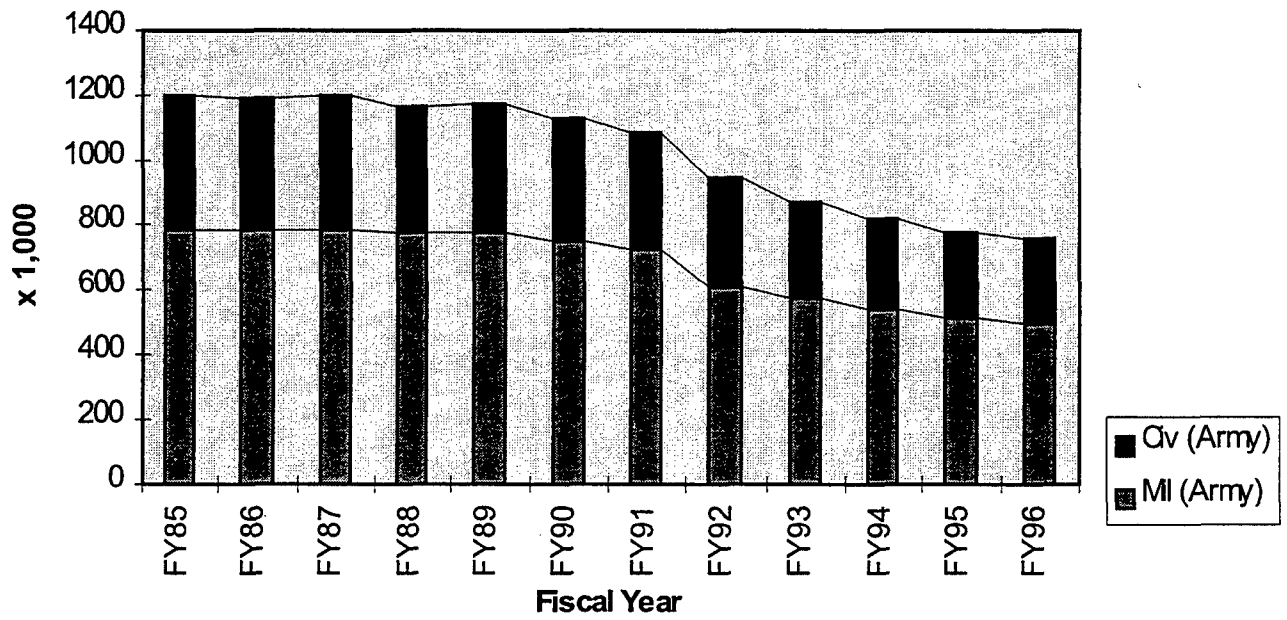
Information Age technology and reengineering initiatives became the principal means of generating increased efficiency and lethality. For the Army's deployable forces, Force XXI became the vehicle for modernization and improving battlefield effectiveness. It comprised three principal development areas: 1) Joint Venture--the redesign of the operational Army; 2) the integration of information technologies into tactics and doctrine; and 3) redesign of the institutional army. Developed under General Gordon R. Sullivan's tenure as the Army's chief of staff, Force XXI provided the Army with a road map for future development that embraced the importance of heavy, mobile forces dominating the battlefield through use of advanced technologies.

¹ Secretary of Defense Les Aspin, "Report on the Bottom-Up Review," Department of Defense, October 1993, pp. 1-2.

² Secretary of Defense Les Aspin, "Report on the Bottom-Up Review," Department of Defense, October 1993, p. iii.

³ Dr. James Williams, "US Army Armor Center and Fort Knox: 1995 Annual Command History," June 3, 1997, pp. 1-9 through 1-10.

Figure 1.1: Army Personnel—Military & Civilian by Fiscal Year, 1985-1996



It represented a natural evolution of ideas emerging at the end of the Cold War and applied during the Gulf War. In particular, Force XXI embraced the value of large-scale maneuver warfare in which mobile heavy forces possessing high-technology equipment played a prominent role.⁴

The Army's downsizing also triggered a series of actions aimed at rationalizing its administrative structure. The most tangible and politically sensitive of these actions were taken by the Base Realignment and Closure Commission. Between 1988 and 1995, the commission presented four sets of recommendations that closed some military installations and merged others. By 1996, 112 posts had been selected for closure and 27 for realignment, but political opposition resulted in many of these recommendations remaining unimplemented.⁵ The closures were intended to generate large savings and contribute to the peace dividend, but no real savings had been realized by 1996. In fact the cost of BRAC actions exceeded the planned savings.⁶ Fears concerning the economic and political impact of installation closures resulted in the dilution the BRAC intent in practice.

Other cost-saving and efficiency-generating initiatives concerned an increased reliance upon automated data processing. Intended to save time and compensate for the loss of personnel, these efforts continue to evolve through the utilization of more advanced computer hardware and software and a more refined sense of what should be tracked. Automated personnel data and tracking, in particular became more detailed, matching a need to ensure the availability of personnel with particular skills with ongoing missions. The reduced size of the Army placed a premium upon accurate information of a soldier's status for mission planning, since substitutes cannot easily be found. For the civilian workforce, the large civilian personnel offices that dealt with a wide range of personnel issues on each post were consolidated into a handful of centralized regional offices. This concentration of function resulted in Army-wide reductions in CPO personnel and activities at the post level. The expected savings in personnel and cost, however, will be accompanied by some loss in services to individuals. Gone are the personalized attention to problems that the larger decentralized CPOs permitted.⁷

Budget considerations drove and continue to drive the search for new efficiencies in all Army operations. The Cold War's end coincided with growing political focus upon domestic programs and reducing the national debt. Without the constant and obvious threat of Soviet-sponsored aggression, the need for the expense of a large military disappeared in the public mind. Instead the military budget became a principal target for budget cuts and the source for the so-called peace dividend. From 1989 defense spending declined, impacting all branches (see Figure 1.2). The ten year period ending in 1995 witnessed a decline in the Defense budget by one third. Within the Army, the services were thrust into competition with each other for portions of a budget that shrank by thirty-seven percent in the same period.⁸ All Army expenditures similarly fell (see Figure 1.3).

⁴ Dr. James Williams, "US Army Armor Center and Fort Knox: 1995 Annual Command History," June 3, 1997, p. 1-2; MG Joe W. Rigby, "Digitizing force XXI: A Team Effort," *Army* (May 1995), p. 38; Frank N. Schubert and Theresa L. Kraus (eds.), *The Whirlwind War: The United States Army in Operations Desert Shield and Desert Storm*, (Washington, D.C.: Center of Military History, United States Army, 1995), p. 234.

⁵ Assistant Chief of Staff for Installation Management, "Base Realignment and Closure Briefing," Undated briefing slides, Internet source from <http://www.hqda.army.mil:443/acsimweb/brac/pwrpoint/sld004.htm>.

⁶ Association of the United States Army, *Army Budget, Fiscal Year 1996: An Analysis*, (Arlington, VA: Association of the United States Army, The Institute of Land Warfare, May 1995), p. 18; Association of the United States Army, *Army Budget, Fiscal Year 1997: An Analysis*, (Arlington, VA: Association of the United States Army, The Institute of Land Warfare, May 1996), p. 21.

⁷ Assistant Secretary of the Army for Manpower and Reserve Affairs Sara E. Lister, "Maximizing the Army's Most Important Asset--People," *Army Greenbook 1996-1997*, (October 1996), pp. 40, 42.

⁸ Dr. James Williams, "US Army Armor Center and Fort Knox: 1995 Annual Command History," June 3, 1997, pp. 1-8 through 1-9.

Figure 1.2: Service Percentage of Budget Authority, FY80-FY96

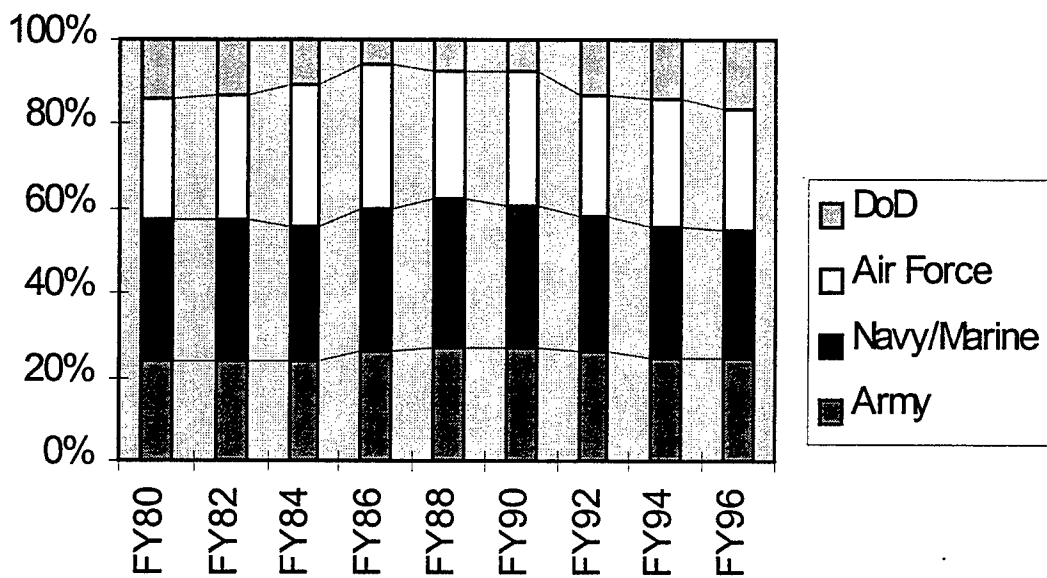
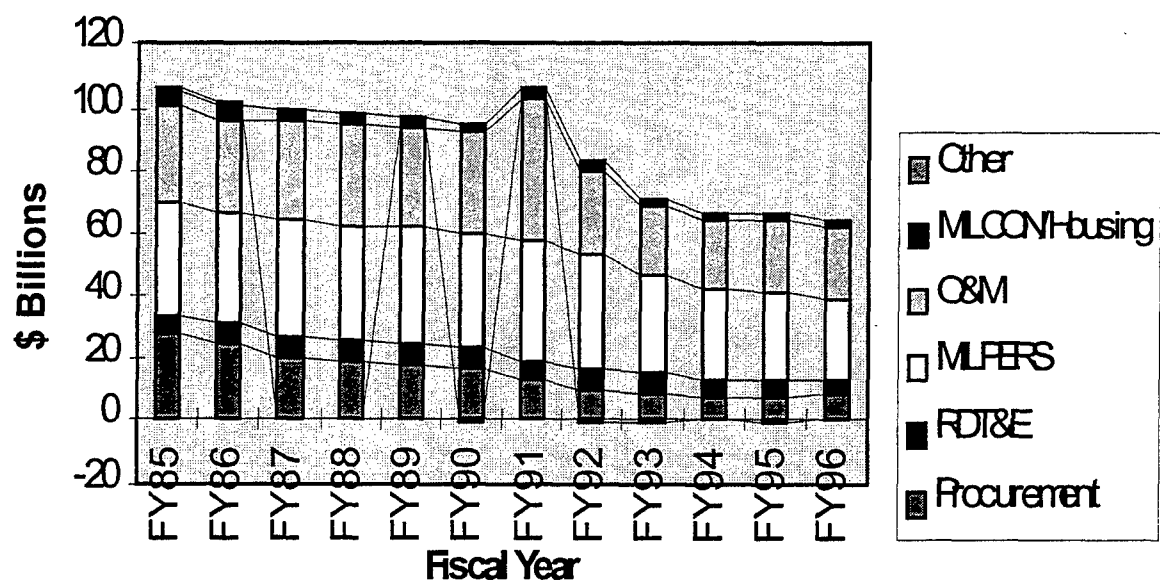


Figure 1.3: Army Budget, FY85-FY96 (Constant \$)



The only area that received some relief in FY 96 lay in quality of life expenditures that received a presidential increase of \$450,000,000.⁹ However, the failure to include the cost of contingency operations into budget planning offset this increase. Instead of including such operations in the fiscal planning process, their cost was met by simply redirecting funding from ongoing programs that might or might not be reimbursed at year's end. In effect contingency operation funding became a tax that upset the careful balance of dollars against functions that the Army sought to implement.¹⁰

A new trend also emerged to undermine military budgeting: the inclusion of non-defense items in the Department of Defense's budget. In the early 1990s activities such as environmental cleanups, humanitarian aid, foreign assistance packages, and noncombat medical research began to appear in the military budget. A review of the inclusion of civil programs in the military budget found that almost \$13 billion in FY 94 went to programs with no or marginal applications to defense concerns. The consequence of this trend lay in the lower funding priority given to more militarily relevant projects.¹¹

The declining military budget contrasted with the desire to field a modern, digitized Army in the early 21st century. No version of the Defense budgets projected through the end of the century would simultaneously sustain the force structure, support required modernization, and compensate for known underfunding.¹² As the overall Defense budget shrank, competition increased among the services for what remained. Interservice competition increased the risk of parochial divisions emerging among the services that would undermine efforts to realize the level of cooperation considered necessary by early experimentation with digitized forces.¹³ Each service strove to market itself and the value of its mission, seeking to attract a few dollars more.

Transition Turbulence in 1996

The monetary and manpower decline that accompanied the military downsizing generated turmoil throughout the armed forces that continued into 1996. Although expected to diminish as the post Cold War end strength was reached, enough change continued to occur at the post level to question the likelihood of any near-term stabilization of funds, manpower, or goals. The electioneering that preceded the presidential election only heightened the sense of concern about the future direction of the military.

The Army's basic force structure suffered few changes since 1995. It remained a ten-division force, although the National Guard lost three separate brigades.¹⁴ The size of the active component remained 495,000 soldiers with 310,000 in operational forces and 125,000 absorbed by the Army's infrastructure. The remaining 60,000 comprised those soldiers unavailable for duty at any given moment. Included in their ranks were soldiers on leave, sick, pregnant, absent without leave, or incarcerated. During the

⁹ Secretary of the Army Togo D. West, Jr., "Doing Right by Soldiers: Putting Them First," Army Greenbook 1995-1996 (October 1995), p. 18; Dr. James Williams, "US Army Armor Center and Fort Knox: 1995 Annual Command History," June 3, 1997, p. 1-9.

¹⁰ Association of the United States Army, Army Budget, Fiscal Year 1996: An Analysis, (Arlington, VA: Association of the United States Army, The Institute of Land Warfare, May 1995), p. 55.

¹¹ Association of the United States Army, Army Budget, Fiscal Year 1996: An Analysis, (Arlington, VA: Association of the United States Army, The Institute of Land Warfare, May 1995), p. 19.

¹² "Projected Funding, JROC/JWCA Update on Organization, Planning and Requirements for TRADOC Commander's Conference," Briefing slide, October 26, 1995, p. 12; Vincent P. Grimes, "Service Chiefs Detail Emerging Funding, Modernization Goals," National Defense (July-August 1995), pp. 16-19; For additional discussion see Dr. James Williams, "US Army Armor Center and Fort Knox: 1995 Annual Command History," June 3, 1997, pp. 1-7 through 1-8.

¹³ L. Edgar Prina, "Roles and Missions Debate Enters Final Stages," Seapower (August 1995), pp. 29; Sandra I. Meadows, "Military Lab Realignment Pinned to Joint Endeavors," National Defense (July-August 1995), p. 38. Also see for further discussion Army Greenbook 1996-1997 (October 1995), p. 7-8.

¹⁴ Association of the United States Army, Army Budget, Fiscal Year 1997: An Analysis, (Arlington, VA: Association of the United States Army, The Institute of Land Warfare, May 1996), p. 28.

course of the year, however, the Army began to prepare for the possibility of a further 20,000 strength reduction under discussion by senior political and military leaders.¹⁵

The Reserve Component and civilian workforce suffered additional reductions in 1996 with further decreases projected into 1997. Figures 1.4 and 1.5 summarize the trends in personnel since 1989. From a highpoint in 1989 of 403,000, the civilian workforce dropped to a projected 252,000 in FY 97 with a planned additional 16,000 cut by 2001.¹⁶ To achieve this reduction, the Army relied upon voluntary and special separation incentive programs rather than involuntary actions. In a parallel effort for military personnel, the Army established selective early retirement boards to encourage soldiers close to retirement to leave early. Congress provided the authorization for these incentive programs and pledged similar authority for the next five years, but the costs associated with early retirement and voluntary separation had to be incorporated into the Army budget. The expected savings from rapidly removing personnel from the payrolls, however, outweighed the short-term costs of these programs.¹⁷

Shortfalls in civilian and military personnel did not result in any reduction in basic missions. In fact the respective workload actually increased as the Army sought to maintain current readiness and continue its development of Force XXI. While future planning continued to emphasize the importance of a heavy digitized maneuver force, near-term threat assessments stressed the need for current readiness and light, highly deployable, lethal systems to support operations. Only regional powers--mainly Iraq and North Korea-- posed any significant heavy force threat. Neither nation justified a large structure of heavy US forces and TRADOC PAM 525-5 noted that "... in the mid-1990s no credible near-term threat to the U.S. exists..."¹⁸

The Army faced the problem of preparing for the future and sustaining current readiness with existing doctrine and matériel. It prioritized its goals and funded only those goals vital to current readiness or the development of the Army After Next. This policy helped to mitigate the effects of diminishing funding and personnel. It permitted the reduced 1990s Army to simultaneously conduct contingency operations and experiment with digital equipment and new doctrine. In particular 1996 witnessed continued preparation for a brigade-size advanced warfighting experiment conducted in March 1997. This AWE intended to assess the influence of digital technology upon current doctrine and TTPs, building upon the results of the earlier AWEs Operation Desert Hammer VI and Focused Despatch. The 4th Infantry Division at Fort Hood provided the forces for this upcoming experiment, and spent 1996 undergoing training with digital equipment and doctrine while outfitting a digitized task force.¹⁹

¹⁵ Association of the United States Army, Army Budget, Fiscal Year 1997: An Analysis, (Arlington, VA: Association of the United States Army, The Institute of Land Warfare, May 1996), p. 33.

¹⁶ Association of the United States Army, Army Budget, Fiscal Year 1997: An Analysis, (Arlington, VA: Association of the United States Army, The Institute of Land Warfare, May 1996), p. 33.

¹⁷ Association of the United States Army, Army Budget, Fiscal Year 1996: An Analysis, (Arlington, VA: Association of the United States Army, The Institute of Land Warfare, May 1995), p. 30.

¹⁸ Quotation from TRADOC Pamphlet 525-5, Force XXI Operations: A Concept for the Evolution of Full-Dimensional Operations for the Strategic Army of the Early Twenty-First Century (Fort Monroe, VA: Headquarters, United States Army Training and Doctrine Command, August 1, 1994, p. 1-1; Robert Gaskin, "The Great 1996 Non-Debate on National Security" in Williamson Murray and Allan R. Millett (eds.), Brassey's Mershon American Defense Annual: Current Issues and the Asian Challenge (Washington, DC: The Chairman, Joint Chiefs of Staff, February 10, 1993), pp. III-1, III-2, III-32 through 39; For additional discussion see Dr. James Williams, "US Army Armor Center and Fort Knox: 1995 Annual Command History," June 3, 1997, p. 1-2.

¹⁹ COL Thomas R. Goedkoop and CPT Barry E. Venable, "Task Force XXI: An Overview," Military Review, LXXVII (March-April 1997), 68-78.

FIGURE 1.4: ARMY PERSONNEL TRENDS

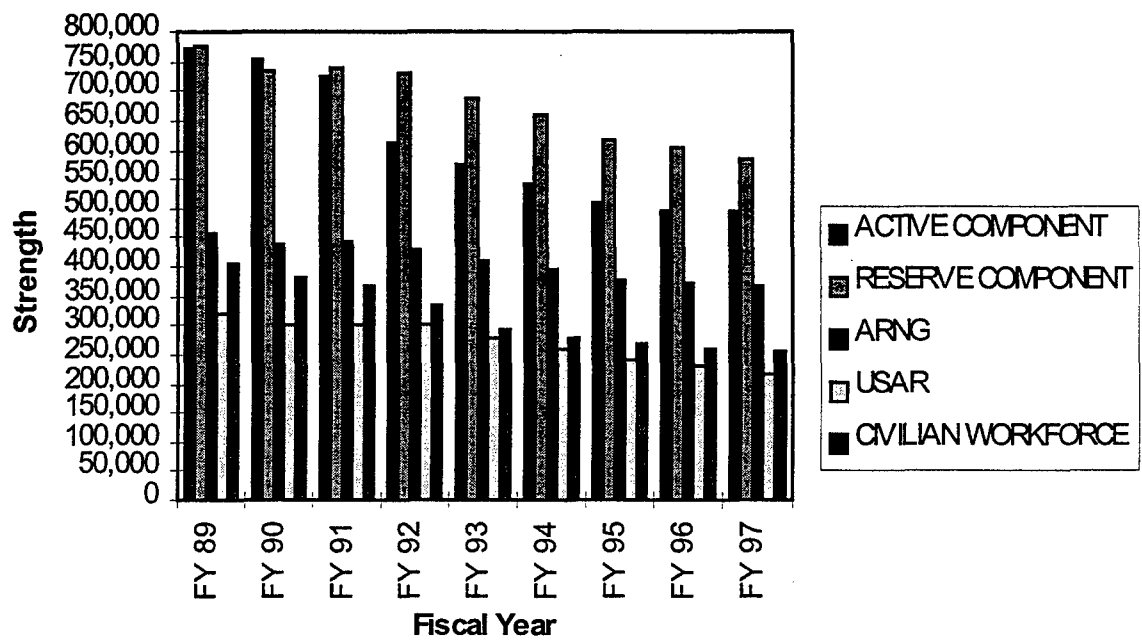
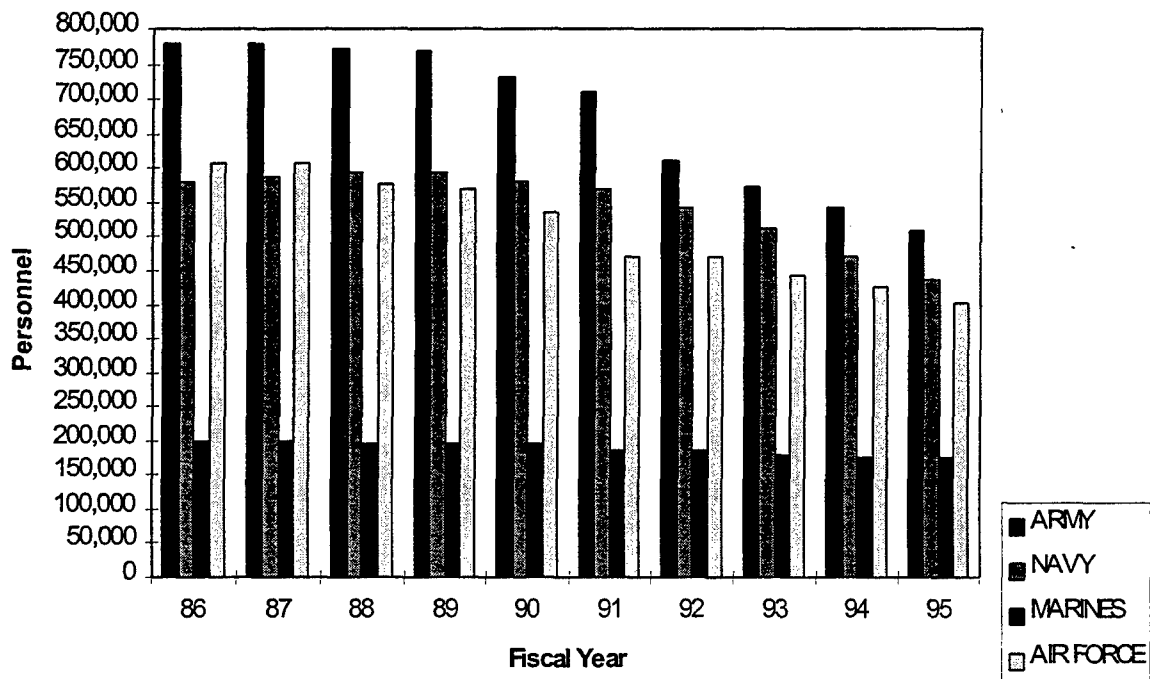


FIGURE 1.5: ACTIVE MILITARY STRENGTH



Force XXI emphasized information management using digital technologies to increase situational awareness, achieve a higher OPTEMPO, and attain battlespace dominance. In particular it focused upon the impact of Information Age technologies upon the DTLOMS. The emphasis upon new technologies required large-scale equipment modernization that in turn forced attention to the manner of fielding digitized units. Since the potential value of digital communications could not be realized in a mixed force equipped with digital and nondigital platforms, the Army opted to field digital forces in brigade sets.²⁰ The brigade represented the basic operational building block for heavy maneuver forces and comprised a combined arms team. Fielding such a unit, however, mandated the synchronization of equipment modernization and fielding schedules among those branches represented in the brigade.

Such synchronicity contradicted the Army's traditional stovepiped branch organization. In the resource-rich environments of the 1970s and 1980s the branches had little reason to coordinate equipment modernization. Compartmentalized project development was affordable and suited the separate modernization goals of each branch. In the 1990s the Army could no longer afford to fund multiple, divergent projects. The decline of research and development funds (see Figure 1.6) forced a prioritization of projects that placed the branches in a competition for resources that contradicted the synchronization of effort needed to field a digitized brigade.

The failure to incorporate funds for contingency operations into the Army's budget planning process further upset the delicate balance of resources against dollars necessary for modernization. To pay the cost of ongoing operations, funds were diverted from ongoing projects, resulting in disruption, delays, and forcing consideration of project cancellation. The C2V, for example, endured a roller coaster ride through 1996, fluctuating between adequate funding and imminent cancellation despite its importance to the future digitized battlefield.²¹

Force XXI concepts also complicated Army training efforts. Preparation for the future operations did not replace the training responsibility for current operations and doctrine. Force XXI doctrine and matériel continuously evolved, placing both instructors and students in a changing learning environment. Readiness sustainment also required instruction in new skills. The Army's shift from a forward-deployed to a projection-based force placed greater emphasis upon logistical support, while the increase in OOTW missions forced a change in training emphasis from conventional high-intensity warfighting to peace operations that placed different demands upon the soldier. Moreover, the related doctrine for OOTW continued to evolve, while the Army obtained experience in these actions. To implement operations across the mission spectrum, units found themselves immersed in training activities in order to meet the combined demands of current and future operations.

Force structure redesign also derived from the Force XXI evolution. The succession of AWEs planned to precede the fielding of digitized formations near the turn of the century provided data regarding the organizational impact of digital equipment. Organizational changes were expected to impact all areas of Army operation, including BASOPS functions. The importance of force structure redesign stems from its link to production goals and strength levels, since these features cannot be determined until a final force structure emerges. The danger lies in overrationalization, thereby forcing the Army to adopt a structure ill-suited for conducting worldwide operations across the mission spectrum.

Nevertheless the trend to rapid rationalization became evidenced in the changes implemented in Army business practices. The high cost of developing and fielding the digital equipment considered necessary for Force XXI coupled with reduced RD&A stimulated adoption of a modernization plan based upon the assumptions that the defense budget would cease to shrink, base closures and reorganization would generate cost savings, and acquisition reform and outsourcing would permit more available funds to be devoted to new equipment.²² Acquisition reform and outsourcing noncore activities in particular became a principal focus during the year. Behind this emphasis lay a belief that Army business practices were

²⁰ COL John F. Kalb, "Fielding of Digitized Forces," e-mail message to Dr. Robert S. Cameron, June 16, 1997.

²¹ See for example "Army Cuts Out-Year C2V Money by \$370 Million; Lawmakers Slice '97 Funds," Inside the Army, June 10, 1996, pp. 1, 13-14; Jason Sherman, "Command and Control Vehicle Approved for Low-Rate Initial Production," Inside the Army, September 30, 1996, pp. 1, 6-7.

²² Secretary of Defense William J. Perry, "Managing Danger: Prevent, Deter, Defeat," Defense 96 (Issue 3), pp. 12-13.

outdated, cumbersome, and inefficient. The net result was a long delay between a project's conception and its fielding that carried a cost no longer acceptable in the post-Cold War environment. Outsourcing transfers the execution of basic post functions from government personnel to the private sector, thereby permitting a reduction in the military's civilian workforce and the related costs. While a proven practice in the business community, it remained a new process only beginning within the Army in 1996.

Driven to adopt cost-saving policies while balancing modernization against readiness, the Army continued to stress the importance of quality of life issues. In listing the priorities of focus for the Army in 1996 Secretary of the Army Togo D. West, Jr. linked modernization, readiness, and quality of life as the principal focus of Army actions.²³ The quality of life emphasis reflected the shift in Army deployments from abroad to CONUS begun at the conclusion of the Cold War. More soldiers living on posts in the United States required additional facilities and support organizations available to military personnel and their families. Thus construction for housing remained constant and less contentious than other proposed construction projects, including ranges. Support organizations like Army Family Team Building sought to ensure that a soldier's family needs were addressed during overseas deployments. The quality of life emphasis, however, created problems at the post level. Undiminished training missions had to be supported by declining workforces and shrinking budgets currently being stretched to provide the quality of life standards considered vital by the Army leadership. Post commanders found themselves forced to choose at the local level between training and quality of life.

Future Expectations

The future seemed to offer some relief from the Army's downsizing and the related turbulence. Senior leaders all looked toward a stabilization in military and civilian personnel levels. The Army seemed to be close to its planned post-Cold War end strength, and the need to jettison excess personnel appeared to diminish.²⁴ The shift from downsizing to maintaining a strength level increased the importance of USAREC activities and retention rates to prevent shortfalls emerging in a streamlined Army.

Reengineering business procedures offered the prospect of large savings that could be utilized to fund Army modernization deemed necessary by Force XXI. These practices derived from the Army's efforts to align itself with the private sector and cope with a shrinking budget. Defined as "the fundamental rethinking and radical redesign of business processes to bring dramatic improvements in performance," reengineering became a buzzword that permeated the federal government.²⁵ Reinvention of government had been a recurrent theme of the Clinton Administration, which launched a National Performance Review that generated a series of initiatives that influenced the military establishment. TRADOC became an Army Reinvention Center with the authority to waive many regulations as it sought greater efficiencies in its operation.²⁶ In a related effort recommendations to radically redesign the Institutional Army emerged. These plans hoped to generate a \$750 million savings that would be applied against a projected \$2 billion gap between available funds and modernization expenses.²⁷

²³ Secretary of the Army Togo D. West, Jr., "The Army Meets Today's Challenges While It Prepares for the 21st Century," Army Greenbook 1996-1997, (October 1996), p. 14.

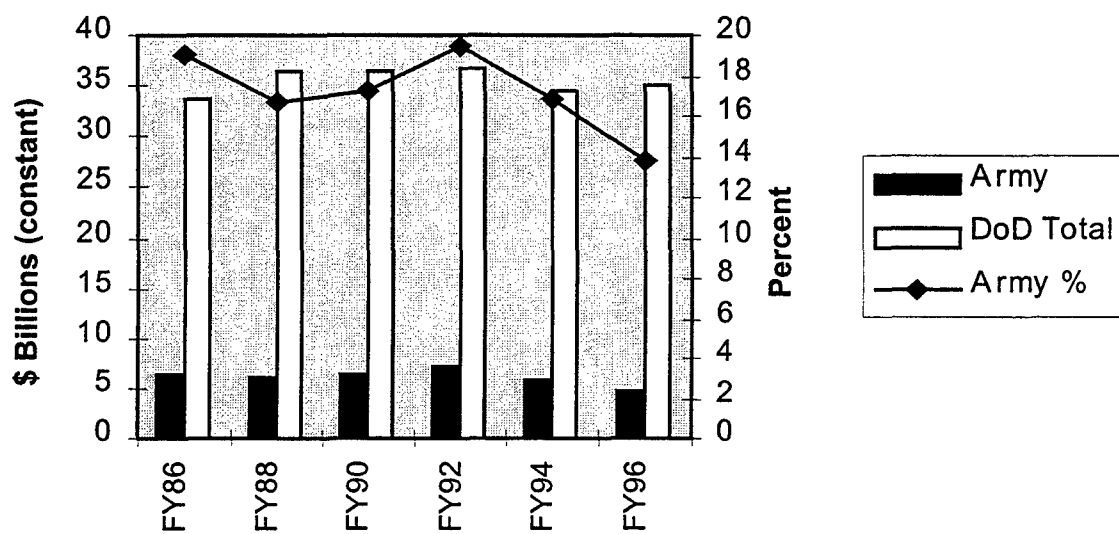
²⁴ Assistant Secretary of the Army for Research, Development, and Acquisition Gilbert F. Decker, Status Report, Army Greenbook 1996-1997 (October 1995), p. 34; Army Reserve Chief MG Max Baratz, "A Restructured Army Reserve," Army Greenbook 1996-1997 (October 1996), p. 98; Deputy Chief of Staff for Personnel LTG Theodore G. Stroup, Jr., "America's Soldier's: Presenting Our Nation's Best," Army Greenbook 1996-1997 (October 1995), p. 144.

²⁵ Michael Hammer and Steven A. Stanton, "The Reengineering Revolution," Government Executive Reengineering: A Guide to Rebuilding Government, (September 1995), p. 2A; for further discussion see Dr. James Williams, "US Army Armor Center and Fort Knox: 1995 Annual Command History," June 3, 1997, p. 1-12.

²⁶ Memorandum (ATCS), "TRADOC Reinvention," August 21, 1995; For further discussion see Dr. James Williams, "US Army Armor Center and Fort Knox: 1995 Annual Command History," June 3, 1997, p. 1-12.

²⁷ Vincent P. Grimes, "Redesigning the Institutional Army Means Radical Changes," National Defense, (April 1996), pp 16-17.

Figure 1.6: Army RDTE Funding Compared to Total



Additional reengineering plans focused upon the requirements process. The general goal remained the reduction of the acquisition cycle time, thereby cutting the cost of an entire project without modifying or eliminating it. However, the requirements process also had to transition into the post-Cold War era. Requirements could no longer be based upon the known capabilities of a specific threat nation, but needed to be based upon the anticipated capabilities of a potential threat. Effectively implemented, this type of redesign would reduce the cost overruns traditionally associated in the public mind with the development of military matériel. The first phase of this reform occurred during the year with creation of integrated concept teams comprising groups of representatives from academia, industry, and interested organizations within the Army to guide the requirements process. These ICTs provide a broader base of ideas at the start of the requirements process and complement the existing integrated product teams guiding production. In another change, TRADOC assumed responsibility for all requirements decisions, clarifying the source of power in the requirements process.²⁸

In April 1996 the Army also approved a TRADOC policy governing the Warfighting Rapid Acquisition Program (WRAP). The purpose of this program lay in providing funds to accelerate the development of emerging technologies with obvious potential value to the Army. The policy linked determination of this value and refining the technology--principal missions of the battle labs--with systems procurement. TRADOC would exercise command authority over the related funding. In the context of Army digitization, TRADOC now had the power to push the development of new technologies considered low risk and high payoff for the Army's benefit. Force XXI proved a principal beneficiary.²⁹

Part of the Army's acquisition reform also focused upon streamlining the program management organization. Three program managers and their offices were merged into one. The Pms for field artillery systems, tactical wheeled vehicles, and armored systems became Future Ground Combat Systems office, permitting the elimination of 2-3000 positions and considerably reducing the overhead for acquisition.³⁰ The Army also created a Reinvention Laboratory for Army XXI Acquisition Reform. This action did not result in a new office, but created a process. Its purpose lay in integrating the material successes of Force XXI and the ongoing AWE process with ideas for acquisition reform in order to secure equipment quickly for the first Army XXI division by 2000.³¹

Further rationalization efforts included the grouping of TRADOC schools according to battlefield function. Known as clusters, these groupings included maneuver, maneuver support, fires, sustainment, battle command, and leadership. This concept had been studied for several years and represented TRADOC's contribution to the generation of savings by merging combat development, training, and doctrine development efforts. Officially introduced at the TRADOC commanders' conference held at Fort Benning in April, the cluster concept sought to address TRADOC's prospected funding shortfall of \$500 million between 1998 and 2003.³²

The trend toward outsourcing continued with more installations contracting work--including weapons maintenance--to industry rather than continue to rely upon federal employees. Funding shortages spurred the proliferation of outsourcing, the practice considered one more means of saving sufficient money to cover the projected costs of modernization over the next few years. Outsourcing also represented the Army's deliberate attempt to apply business practices in use in the private sector for years to its own activities. While primary missions continued to remain the focus of the military, secondary functions were outsourced, especially in the BASOPS arena. The potential savings made the practice

²⁸ Vincent P. Grimes, "Redesigning the Institutional Army Means Radical Changes," National Defense, (April 1996), pp 16-17; Jason Sherman, "Draft Document Outlines New Procedures for Determining Requirements," Inside the Army, January 22, 1996, pp. 1, 1-12, includes copy of draft policy.

²⁹ "Army Approves New Plan for Rapid Acquisition of Advanced Technology," Inside the Army, April 29, 1996, pp. 1, 8-11, includes actual policy.

³⁰ Christopher T. Heun, "Army Merges Three Offices Into Ground Combat Systems," National Defense, (November 1996), p. 41.

³¹ "From the Acquisition Office..." Army RD&A, (November-December 1996), p. 59.

³² Tami Terella-Faram, "TRADOC Chief Proposes 'Cluster' Concept for Army Centers and Schools," Inside the Army, May 6, 1996, pp. 1, 16-17.

attractive and likely to expand in the next few years, despite congressional scrutiny and an increase in lawsuits by federal employees, whose positions became excess through outsourcing.³³

Automated data management also gathered momentum during the year. Although not new for 1996, the observed deficiencies of older electronic data management systems spurred development of improvements intended to increase utility. SIDPERS-3, for example, is a system to automate personnel actions and due to be fielded in 1997. It will provide a better forecasting tool to determine the timing and location of a soldier's next move, allowing more efficient preparation and reducing the impact upon the family.³⁴ For the RC a new personnel electronic record management system sought to provide more accurate and updated information on RC personnel. Better tracking of soldiers is considered one means of increasing their efficiency. Precise tracking of the individual permits his rapid deployment wherever needed and minimizes the likelihood of a soldier being unavailable when required or unable to be contacted at all.³⁵ In the logistics realm special Army teams visited installations and recommended improvements in operations intended to shorten the time between request and receipt of supplies, seeking to match or surpass the capabilities in the private sector. Application of velocity management principles also relies upon automation and anticipates the reduction of personnel associated with inventory management services. Similar efforts sought to utilize digital technology in operational environments, permitting the anticipation and delivery of supplies to combat units without a cumbersome request and response process.³⁶

These rationalization efforts did not occur in a vacuum. They derived from an emerging vision of future that helped identify key objectives around which the Army could organize its reengineering process without plunging the military into chaos. In November General Reimer introduced Army Vision 2010 that identified the goals of the Army's ongoing evolution into the Information Age. Its emphasis upon maneuver, force projection, precision strike capability, winning the information war, force protection, and force sustainment did not represent a radical departure from previous visions. Instead Army Vision 2010 stressed increased use of enabling technologies that would enhance overall effectiveness, and reaffirmed the Army's belief that land forces would represent the principal power of decision into the foreseeable future. This emphasis directly contradicted a growing popular interest in the use of standoff precision weapons that would obviate the need to deploy American ground forces in potentially messy and dangerous environments.³⁷

The Army's new vision built upon the near-term areas of emphasis previously identified by General Reimer as readiness, modernization, and quality of life. It also derived from Joint Vision 2010, governing the nation's armed forces, which focused upon improving overall effectiveness by exploiting new technologies. Such action was expected to increase the lethality and efficiency of the armed forces despite their shrinking size. On the battlefield the military could anticipate achieving the effects of mass without physical concentration. Winning in the more dispersed environment of the 21st century, however, necessitated information superiority. Thus Joint Vision 2010 embraced the theme of "multidimensional application of information, engagement and mobility capabilities to position and employ widely dispersed joint air, land, sea and space forces to accomplish the assigned operational tasks."³⁸ The full impact of Information Age technology upon the DTLOMS, however, remained to be determined through the ongoing Force XXI evolution.

³³ Sandra I. Meadows, "Outsourcing of Weapon Maintenance 'Inevitable,' Says Defense Depot Chief," National Defense, (May-June 1996), p.27; "Migration of Defense Activities to Private Sector Gains Tempo," National Defense, (July-August 1996), pp. 44-45.

³⁴ Deputy Chief of Staff for Personnel LTG Theodore G. Stroup, Jr., "America's Soldiers: Presenting Our Nation's Best," Army Greenbook 1996-1997, (October 1996), p. 149.

³⁵ Army Reserve Chief MG Max Baratz, "A Restructured Army Reserve," Army Greenbook 1996-1997, (October 1996), pp. 103-105.

³⁶ Deputy Chief of Staff for Logistics LTG John C. Coburn, "Focused Logistics--Projecting and Sustaining Army XXI," Army Greenbook 1996-1997, (October 1996), pp. 128, 130, 132.

³⁷ "'Vision 2010' Outlines Goals Beyond Force XXI, before Army After Next," Inside the Army, November 11, 1996, pp. 1, 8-13, includes text of vision statement

³⁸ General of the Joint Chiefs of Staff General John M. Shalikashvili, "Joint Vision 2010: Force of the Future," Defense 96 (Issue 4), pp. 6-21.

The importance attached to new digital technologies reflected their dominance upon Force XXI activities and their influence as the driving force behind Army modernization. While Force XXI and Army Vision 2010 did not provide a detailed description of the Army's end state in the early 21st century, they did provide guiding principals for modernization efforts. Taken in conjunction with a growing awareness of viable technological capabilities obtained from Desert Hammer VI, Focused Despatch, and the ongoing activities of the EXFOR at Fort Hood, these guidelines permitted the branches to concentrate their dwindling resources upon more focused modernization programs. In the Armor community, this focus manifested itself in the consensus established during the Armor Caucus process begun in 1995, concerning future tank development that in turn permitted the completion of a viable tank modernization plan. This plan deliberately avoided continuous and costly upgrades to the Abrams tank in favor of modest improvements and concentration of effort upon an entirely new revolutionary combat vehicle identified as the Future Combat System, intended for fielding between 2010 and 2015.³⁹

Threats to Future Expectations

Realization of modernization and development plans, however, suffered a series of real and potential setbacks during 1996. These threats emerged in the form of uncertainty about the political impact of the November presidential election, continuous modification of modernization plans to fit sliding budgetary constraints, and an increase in the deployment rate. The year ended with the Army facing a Quadrennial Review of its organization and activities on a scale similar to the Bottom-Up Review of 1993 and the emergence of a sex scandal that threatened to undermine the Army much as the Tailhook scandal had impacted the Navy.

The Army's emphasis upon the importance of Information Age technology generated a massive demand for new equipment. Only through widespread digitization could the value of this technology be realized, mandating an all or nothing approach to modernizing the Army. The associated price tag proved enormous and attracted continuous scrutiny throughout the year. Threatening the entire digitization was a growing clamor in Congress for reliance upon standoff/precision weapons that obviated the need for an expensive modernization effort. This concept also reinforced a popular misconception that such precision weapons were widely available, effective, and replaced the need for a ground presence. People remembered only too well the Air Force's carefully selected and oft-played film footage of smart bombs hitting small targets during the Gulf War. Not so obvious was the limited arsenal of such weapons and the high cost associated with them, irrespective of their effectiveness.

While denouncing the growing interest in standoff weapons as misplaced, the Army prepared its budget for FY 97. At completion it totalled \$60.1 billion, an amount less than that received in FY 96 and a figure considered by the Army to be less than necessary to ensure timely efficient modernization. The budget proposal safeguarded near-term readiness, quality of life, and installation improvements.⁴⁰ The Secretary of Defense, however, ordered a cut of \$3.1 billion in planning for FY 98 that directly impacted the development and procurement programs already underway.⁴¹ Estimates for FY 98 anticipated a \$10.3 billion shortfall in funding considered necessary for the Army and a \$2 billion gap specifically in the area of modernization. Against this backdrop, the Army sought means to achieve cost savings that would reduce this gap. Consequently, it dropped the Armored Gun System and opted to end procurement of the UH-60 Blackhawk helicopter. The cancellation of the AGS, however, also affected the fielding schedules of subcomponents intended for future combat vehicles, since they were to have been fielded and refined with

³⁹ Chief of Armor MG Lon E. Maggart and Program Executive Officer for Armored Systems Modernization MG John E. Longhauser, "Tank Modernization Plan," United States Army Armor Center, Fort Knox, September 9, 1996, pp. 11-13.

⁴⁰ "Army Seeks \$60.1 Billion in FY-97; Allots \$10.6 Billion for R&D, Acquisition," Inside the Army, March 4, 1996, pp. 1,6-14, includes budget statement, charts, and data regarding the budget.

⁴¹ "Pentagon's Fiscal Guidance Gives Army Topline of \$57 Billion for FY-98," Inside the Army, April 15, 1996, pp. 1, 8-9.

the AGS before incorporation into other platforms.⁴² The AGS project symbolized the Army's modernization dilemma: how to balance decreased/decreasing budgets with technology-intensive initiatives for future forces. It expected to generate savings through additional base closures, acquisition reform, and increased outsourcing, but the precise mechanics of these efforts remained to be determined.⁴³

While trying to resolve its modernization deficit, the Army found little consolation in the continuation of the Bosnian mission, since the question of paying for contingency operations had not been resolved. Instead, ongoing programs continued to be targeted for cuts to cover the cost of these operations.⁴⁴ The presidential election focused public attention upon budget issues, causing consternation among the Army about its impact upon military spending. After President Clinton's reelection, the Army faced a new round of personnel and funding cuts unrelieved by the December announcement of the start of the Quadrennial Defense Review. Congress considered it part of a continuum begun in 1993 that required an analysis of the nation's defense needs and determination of how best to meet those needs. The announcement of the QDR's commencement noted that no organization or project was free from review or restructuring.⁴⁵

While the Army prepared for another round of Congressionally-mandated changes that would likely include losses to personnel and resources, and directly impact an already precarious modernization effort, it found little solace in the views of prominent and influential politicians.

Already trying to maximize its readiness through greater training and utilization of the Reserve Component, the Army found even these efforts subject to criticism and scrutiny. A former Assistant Secretary of Defense for Manpower and Reserve Affairs recommended large-scale troop reductions and shrinking the troop readiness fund. On the Senate Armed Services Committee Senator John McCain argued for a reduction in the need for military forces, especially ground forces. Instead of maintaining a significant ground force capable of global deployment, he advocated a redirection of funds to the Navy, an organization he considered better suited to cope with world crises.⁴⁶

Despite the budget battles and questions of force structure, at least the Army remained free of any major public scandal that might alienate vital political support--until November. In that month the public received its first news of sexual harassment in the Army at Aberdeen Proving Grounds. At first the scandal appeared an isolated incident at one post, but it quickly became apparent that the extent of sexual harassment throughout the Army suggested a much larger problem. In particular it focused critical scrutiny upon the role of women in the Army and Army policies toward them; areas that had been positively depicted in Defense.⁴⁷ By year's end the Army was involved in an expanding scandal that would encompass all ranks and end the careers of several senior generals by mid-1997. New questions emerged regarding the linkage between morality, sexuality, and professional conduct that mirrored similar queries in the general public. The President, himself, faced charges of sexual harassment that the Supreme Court ruled could not be deferred while in office. Rapid resolution of the scandal proved impossible, and the Army can expect the repercussions and controversy to continue throughout 1997 with a corresponding public distraction from Force XXI and modernization.

⁴² Jason Sherman, "Budget Squeeze Drives Army to Terminate Armored Gun System Program," Inside the Army, Special Report, January 26, 1996, pp. 1-2; Daniel G. Dupont, "Army Ends Funding for Black Hawk Helicopters in 1998-2003 Spending Plan," Inside the Army, May 20, 1996, pp. 1, 11.

⁴³ Richard L. West, "Defense Funding in a Balanced Budget Environment," Army, (June 1996), p. 18.

⁴⁴ Daniel G. Dupont, "Pentagon Proposes Cutting Congressional Add-Ons For '96 Bosnia Cuts," Inside the Army, January 8, 1996, pp. 1, 8-9.

⁴⁵ "Pentagon Leaders Publicly Unveil Plans for Quadrennial Defense Review," Inside the Army, December 16, 1996, pp 10-15.

⁴⁶ Edward B. Atkeson, "The Threat From Washington," Army, (July 1996), pp 11-12.

⁴⁷ See "Defense Women Lead the Way," pp 22-33 and "Sexual Harassment Declining, but Still Relevant," in Defense 96 (Issue 4), pp. 34-37.

CHAPTER 2 SYNOPSIS

This chapter presents General Maggart's vision and related goals for post reengineering. It explains how he sought to realize his vision and the related thought processes. It concludes with his perception of the progress made in implementing this vision.

Chapter 2: A Waypoint in the Future: Reengineering the Armor Center and Fort Knox

The institutional army became the principal target for cost savings to permit the modernization deemed necessary for Force XXI. This modernization had to be reconciled against current readiness needs, sustaining quality of life, and reduced personnel and funding. TRADOC's designation as a reinvention center in 1995 symbolized the challenge and the response. Between 1989 and 1996 TRADOC suffered a 39% cut in resources and a 36% loss in manpower.¹ As a reinvention center TRADOC could effect basic changes in its organization and operation and waive obstructive regulations in the interest of building the future army.

TRADOC reinvention used business tools adopted by the Department of the Army and government reform efforts. These tools influenced the creation of Strategic Plan 1995, U.S. Army Training and Doctrine Command and the Force XXI Campaign Plan. They included Activity Based Costing, Service Based Costing, total quality management methods, and the Army Performance Improvement Criteria. TRADOC guidance to subordinate installations stressed reengineering. While following the TRADOC Strategic Plan and Force XXI Campaign Plan, post commanders would apply APIC, SBC, ABC, and Total Army Quality (TAQ) methods.² By applying modern management practices and shuffling personnel, funds, and organizations TRADOC would seek efficiencies. Post commanders, however, also found themselves struggling to balance the theoretical gain from reengineering against the grubby realities of entrenched bureaucratic processes familiar to the workforce.

At Fort Knox MG Lon E. Maggart zealously embraced post reengineering. He believed radical redesign necessary and constructive. Responding to TRADOC guidance, he built reengineering into a revitalized strategic planning process to ensure the Armor Center possessed a solid fiscal base to support future developments in a tight resource climate. He linked strategic planning to a set of goals, objectives, and tasks that served as milestones in realizing his vision for the Armor Center and Fort Knox. Simultaneously he undertook reorganization, applied TQM methods, empowered the workforce, and tried to replace stovepiped communication channels with a horizontal net. To secure additional funding, he volunteered the post for TRADOC pilot projects associated with reinvention and reengineering ideas. Occurring in an eighteen month period, the rapid pace of change created a sense of chaos and frenzied activity. However, the commander's actions stemmed from a clear vision of how Fort Knox had to posture itself to remain competitive and solvent without sacrificing its workforce.

A Vision for Fort Knox

General Maggart's vision and its implementation dominated all activities at Fort Knox during his tenure as commander. The vision itself was simple:

Fort Knox is the Army's mounted technological center of excellence whose workforce is empowered to use intellect, creativity and innovation to lead the force into the next century; and to make Fort Knox the best place in the military to live, work, and play.³

The statement reflected the great importance General Maggart placed upon a workforce motivated by a sense of dedication, commitment, and responsibility to the entire post community rather than a

¹ MG Lon E. Maggart, "The Big Picture: TRADOC Reengineering," briefing slide from Fort Knox Update, September 10, 1996.

² USAARMC, "Salt River Country Strategic Plan," draft, September 10, 1996, pp. 10-13; MG Lon E. Maggart, "Tools for Resource Optimization," briefing slide in BASOPS section of presentation entitled "Fort Knox Briefings for General Reimer, CSA," July 1996.

³ USAARMC, "Salt River Country Strategic Plan," draft, September 10, 1996, p. 14.

paycheck.⁴ In fact he considered his ability to build cohesion and develop team spirit an important factor in his appointment as commander.⁵ He attributed this capability to the personal importance he attached to family, teamwork, and constructive community relations. He remained convinced that his actions at Fort Knox could shape the perception of the Army in a positive manner.⁶

Organizational management concepts attracted General Maggart. He enjoyed analysis and experimentation with management styles and organization structures. Obedience to a central authority shaped his professional development. Even so he remained critical of centralized, hierarchical organizations. He believed they stifled open communication and cross-talk among their components. In lieu of traditional stovepiping, he preferred a collection of open networks that stimulated the flow of information and ideas. Such an organization would more easily accommodate change.⁷

The Commander's Planning Group was one piece of the network. General Maggart created this organization within the headquarters staff to assist him in planning and implementing changes on post. The small group of officers comprising the CPG discussed new ideas and assumed responsibility for developing a strategic plan. They also helped determine the assignment of tasks to realize the commander's vision. By assuming responsibility for the administrative details of the commander, the CPG enabled him to devote more attention to the broad policies that would shape the post. The fundamental changes General Maggart sought made this ability to provide post-wide guidance critical. In effect the CPG promoted centralized guidance at the expense of micromanagement.⁸

General Maggart believed few Army organizations possessed a sense of direction. They lacked focus. He believed the vision that he had written himself would prevent Fort Knox from meandering into the future. He described his vision statement as a "waypoint in the future," and it served as the startpoint for determining how Fort Knox would enter and evolve in the Information Age. It reflected his belief that a leader's vision became the driving force behind an organization's evolution.⁹ The forward-looking thrust of his own vision embodied a key managerial challenge: how to fundamentally change the business practices of Fort Knox simultaneous with teambuilding throughout the workforce.¹⁰

Creating the vision, however, represented only the first act in preparation for post restructuring. To reach the future waypoint, a series of intermediate steps needed to be determined. Consequently, throughout much of his eighteen-month tenure as commander, the post leadership developed and refined a list of goals and objectives necessary to realize the vision. Collectively they described the path Fort Knox would follow into the 21st century. Figure 2.1 shows the final version of the goals on the eve of General Maggart's retirement.¹¹

Figure 2.1: General Maggart's Goals

- Fort Knox--An Installation of Excellence
- An information infrastructure that enables communications across Fort Knox and the force
- Mounted leaders who can effectively lead forces of today
- Mounted leaders who can effectively lead in the 21st century
- Mounted soldiers who are trained to fight today
- Mounted soldiers who are trained to fight in the 21st century
- Task based structured unit training that meets today's requirements
- Task based structured unit training for producing 21st century units

⁴ MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996.

⁵ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, p. 1.

⁶ MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996.

⁷ Dr. Robert S. Cameron, Notes of interview of MG Lon E. Maggart, August 6, 1996

⁸ Dr. Robert S. Cameron, Notes of interview of MG Lon E. Maggart, August 6, 1996

⁹ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, p. 6.

¹⁰ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, p. 16.

¹¹ USAARMC, "Salt River Country Strategic Plan," draft, September 10, 1996, p. 18. This document also contains a listing of the corresponding objectives and tasks for each goal.

- Force development that meets the requirement for Force XXI and beyond
- Digital battle command brigade and below for Force XXI and beyond
- Mounted digital operations literature that meets or exceeds the requirements for supporting the Mounted Force of the 21st century
- Fort Knox--the leader in mounted technology
- A quality Armor Force now and in the future

General Maggart did not dictate the goals and objectives. Instead he adopted a consensus-building process in which the directors and commanders participated. Although more time-consuming, this approach encouraged the commitment and interest of the post leadership in realizing the commander's vision.¹² The goals and objectives stemmed from input provided by the directors and commanders. The CPG integrated this input into a single listing for the entire post.¹³

To generate the goals and objectives the post undertook an analysis of its activities. This analysis determined the key functions that Fort Knox would resource. Other activities would either be dropped or their execution transferred to an external party. The final list of goals and objectives incorporated the result of this prioritization process. Against it could be balanced Fort Knox's available personnel, equipment, and financial resources. Indeed such prioritization had become paramount. While the post's mission-related activity level remained constant since 1991, military appropriations fell 32% and authorized personnel declined 21% in the same period.¹⁴

Connectivity

To realize his vision General Maggart wanted to create a "high performance unit" from the Fort Knox workforce. Collective pride in its accomplishments and in the simple act of conducting its daily routine characterized such a unit. Its members shared a sense of purpose in the organization's actions, no matter how menial their individual tasks might be. All recognized the importance of their separate actions to the unit's objectives and benefited from the consequent high morale. The resulting synergy of effort produced dynamism, greater efficiency, and a keen desire to be in the organization, which they considered vitally important.¹⁵

Such a high performance unit had to be nurtured. It could not develop without an open flow of information throughout the workforce. Without this connectivity, workers performed their tasks in relative isolation, uncertain how their actions benefited the post. General Maggart wanted to eliminate this isolation and improve performance through massive expansion of the information flow.¹⁶ Establishing open communications among the directorates, commands, and senior leadership proved critical to realization of General Maggart's vision. During a briefing of Army Chief of Staff General Dennis J. Reimer he acknowledged this point, depicting connectivity as the principal condition for success.¹⁷ Without an unobstructed horizontal information flow, the Armor Center's components would not be able to integrate their actions. Overlapping responsibilities would continue to characterize the post and no efficiencies would be realized.

While Deputy Commanding General, however, General Maggart noted that the senior leadership did not always receive information about ongoing activities. This situation partially stemmed from the rapid pace of operations, but it prevented understanding and effective implementation of the commander's

¹² Dr. Robert S. Cameron, Notes of interview of MG Lon E. Maggart, August 6, 1996.

¹³ Dr. Robert S. Cameron, ATZK-PTH, "Strategic Planning Process and TAQ," Memorandum for the record, June 26, 1997.

¹⁴ MG Lon E. Maggart, "Fort Knox Downsizing," briefing slide from Fort Knox Update, September 10, 1996.

¹⁵ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, pp. 7-8.

¹⁶ Dr. Robert S. Cameron, Notes of interview of MG Lon E. Maggart, August 6, 1996.

¹⁷ MG Lon E. Maggart, "Goals," briefing slide in presentation entitled "Fort Knox Briefings for General Reimer, CSA," July 1996.

goals. Subordinates remained unclear of the commander's intent and unintended consequences resulted. This situation resembled the chaos that occurred during NTC rotations when subordinate commanders did not understand their specific missions or their relation to the commander's intent for the battalion.¹⁸

General Maggart's remedy lay in open communications throughout the post. He first issued a statement to his personal staff, emphasizing the treatment of people with dignity and respect. He sought to create an environment conducive to frank discussion of issues in which the participants did not fear reprisals for honest appraisals. He further allowed and encouraged direct and open communication with himself. He also revised the hotline system that permitted the commander to be quickly apprised of critical developments. A simple set of rules governed the hotline. The most important one directed that a hotline not be answered by a secretary. He repeatedly stressed that his own hotline would be answered by himself, and he encouraged people to use it to establish a direct link to the commanding general.¹⁹

He believed himself an atypical general officer because of his willingness to address anyone and everyone. He encouraged the same behavior among the workforce. He believed the fostering of an environment where people could talk and function without being bound by rigid courses of action or established precedent worth the risk of being seen as flippant or not serious about his command responsibilities.²⁰

The regular meetings of the senior leadership he reorganized. Renamed Coordination Meetings, attendance expanded from principally military commanders to include the civilian leaders and managers. The additional participation increased information flow and underscored General Maggart's interest in hearing many opinions. He used the Coordination Meetings to assess progress toward his goals. They also brought the civilian and military leadership together to encourage their mutual support and cooperation in realizing his vision. The Coordination Meetings did not replace the staff coordination necessary for specific tasks. But they did help identify those organizations and individuals that needed to cooperate to accomplish specific tasks.²¹

He further sought to share information through greater utilization of the Channel 12 television services available and electronic townhall meetings. These mediums established a linkage with residents in the post housing areas and in the surrounding communities. These actions helped to illustrate how everyone on and around Fort Knox had an interest in post developments. Moreover, people could see and experience the open communications being established by directly talking to the senior leadership during the townhall meetings. The commander's tendency to wander about the post and appear unexpectedly on an office doorstep only reinforced the perception of an accessible commander.²²

General Maggart considered electronic communication a principal means of connectivity and a staffing medium. The existing supporting electronic infrastructure, however, he described as a "disaster." Demands upon it surpassed its capability. Consequently, he supported a series of upgrade efforts.²³ These upgrades comprised part of an installation plan to build a new information infrastructure. Dubbed "Hot Loop XXI" by General Maggart, this plan originated with Fort Knox's DOIM in 1992 and received consistent command support. It represented DOIM's effort to prepare the post for the 21st century.²⁴

Hot Loop XXI used Information Age technology to build a communications capability sufficient to meet the post's needs in the foreseeable future without costly additional modernization. The resulting infrastructure would permit adoption of expected new technologies without significant modification. A critical first step lay in the replacement of the existing 1940s vintage lead-sheathed copper wire with fiber optic cable capable of handling .75 gigabytes of information per second. This fiber optic cable constituted

¹⁸ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, p. 2.

¹⁹ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, pp. 2, 4.

²⁰ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, p. 9.

²¹ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, p. 3; Dr. Robert S. Cameron, Notes of interview of MG Lon E. Maggart, August 6, 1996.

²² Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, pp. 4-5.

²³ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, p. 4.

²⁴ DOIM, "Fort Knox DOIM Hot Loop," briefing slides, undated; MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996; Dr. James W. Williams, "US Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, pp. 5-23 through 5-26.

the backbone of the entire infrastructure. It would facilitate connectivity on post and with other installations via internet servers. It also offered the future possibility of creating a telecommunications network that linked individual personal computers throughout Fort Knox. Hot Loop XXI directly supported the trend in the Armor School toward distance learning initiatives, building Classroom XXI, and the development of exportable training packages.²⁵

In the meantime Fort Knox's internal and external communications ability remained constricted by reliance upon the cumbersome PROFS e-mail system. As electronic communication usage rose, the dial-in access resulted in a steady increase in busy signals. A gap opened between the ability of the existing servers and PROFS to support the outburst of electronic activity characterizing the workplace. DOIM's solution lay in the planned exploitation of the post's growing fiber optic linkage. It would build multiple internet servers that in turn would support the creation of interlinked local area networks. Information Management Officers would monitor LAN operations to prevent and solve problems. Moreover the new servers and their related capacities would become the foundation for a more secure communications link that connected post organizations to each other and to the rest of the world. By 2000 DOIM envisioned centralized management and control over a communications infrastructure possessing secure worldwide access. For the individual PC user, PROFS would disappear, replaced by Microsoft Exchange, a more user-friendly and efficient e-mail system.²⁶

Implementing this plan, however, occurred at a slower pace than desired by DOIM or General Maggart. Delays and shortfalls in funding permitted only incremental progress.²⁷ Completion of the fiber optic link was expected by 1997.²⁸ Unfortunately, in 1996 DOIM could secure only about \$9 million of the estimated \$11 million necessary to complete server installation and the related software purchases (see Figure 2.2). Additional funding would also be required to upgrade computers. Once fully implemented the plan would require a yearly cost of at least \$750,000 for computer replacement, training, and general maintenance. However, by January 1997, the directors and staffs of several key organizations had been linked into LANs and upgraded to Microsoft Exchange. The rest of the post organizations were scheduled for similar enhancement in 1997.²⁹

Fiscal Management

Army efforts to balance a shrinking budget against needs found reflection at Fort Knox. To ensure the availability of modernization funds, pursue quality of life initiatives, and maintain readiness, the Army sought reform in its business practices and organization. This effort inspired General Maggart's parallel efforts at Fort Knox. He considered the post sufficiently funded. The problem lay in optimizing the use of that funding. He believed the solution lay in breaking bureaucratic precedents to balance funds against prioritized functions in a viable strategic plan that incorporated his goals and objectives.³⁰ Of particular concern was posturing the post to prepare for a smaller training load--and therefore smaller budget--in the future.³¹

²⁵ DOIM, "Fort Knox DOIM Hot Loop," briefing slides, undated; MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996; Dr. James W. Williams, "US Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, pp. 5-23 through 5-26.

²⁶ DOIM, "Fort Knox DOIM Hot Loop," briefing slides, undated.

²⁷ Dr. James W. Williams, "US Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, pp. 5-23 through 5-26.

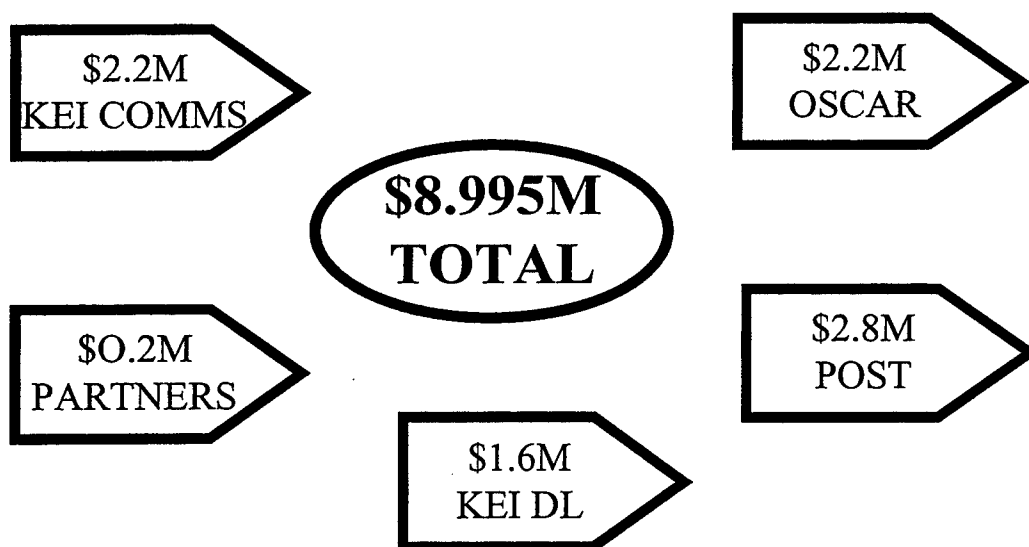
²⁸ Dr. Robert S. Cameron, Interview with Chief of Staff COL Jerry L. Veach, September 6, 1996.

²⁹ DOIM, "Fort Knox DOIM Hot Loop," briefing slides, undated.

³⁰ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 13, 1996.

³¹ Notes of Coordination Meeting, July 3, 1996.

FIGURE 2.2: HOT LOOP XXI FUNDING SOURCES



He first sought to determine the cost to do business. He did not believe the commander could function effectively without this information. Thus review of existing business practices and their cost became linked to realizing his vision. Yet no central method existed to collect the data that would provide this information. The directorates and commands only partially tracked the expense associated with each of their activities. To overcome this deficiency General Maggart introduced two software-based data tracking processes: Activity Based Costing and Service Based Costing.³²

Activity Based Costing is a management tool to assist managers understand how their organizations consume resources.³³ It resembles the personal finance software used in the private sector to monitor household expenses and manage savings, and it is especially suited to track repetitive processes.³⁴ Following a successful trial run in DOL's Maintenance Division that completed early in 1996, General Maggart directed DRM to implement ABC throughout the installation. DRM prepared plans to apply ABC to the rest of DOL, the Armor School, and DPW in 1997. However, insufficient funding existed for all three organizations, and the DPW portion remained an unfunded requirement.³⁵

Service Based Costing identifies common installation services, the resources used to provide them, and the output measures associated with them. In early 1996 the VCSA announced the award of a contract with Calibre Systems, Inc. to implement SBC for all Army installations. Intended to help a post predict its level of services and the related cost, SBC is a tool that can be used to predetermine the impact of changing BASOPS organizations and functions. In turn standard levels of service and performance can be established and used as a baseline to measure the impact of change upon resource usage. Fort Knox implemented SBC in May 1996 and preliminary data had been collected by July. More detailed information would be obtained by year's end.³⁶

Neither ABC nor SBC represented a management concept. They constituted tools to assist in assessment of how and at what cost Fort Knox conducted business. Yet a degree of uncertainty and confusion surrounded their implementation. Use of data tracking software stimulated concerns about the flexibility directorates would retain. Worse, some individuals perceived ABC and SBC as a threat to the internal operations of their organization. Consequently, the data collection process for ABC and SBC encountered resistance, although the bulk of the post management tried to implement them.³⁷

ABC and SBC supported General Maggart's efforts to reengineer Fort Knox. They would provide the data to shape decisions about where and how to realize efficiencies. In 1995 he had already started a review of all the functions the post performed. The results of this review fed the process to determine the goals and objectives necessary to realize his vision. The review also helped to prioritize the post's activities and determine the profitability of each one. Its results would influence the allocation of resources and the determination of which organizations would be the executors of specific goals and objectives in his vision. It became a critical link between the future and the present that could not be ignored.³⁸ Based upon the outcome of the functions review, General Maggart planned to reinforce success by moving money from activities generating little or no profit to ones proving lucrative such as the golf course.³⁹

To incorporate this information into the budget preparation and forecasting process, General Maggart designated the Director of Force Developments COL Edward A. Bryla as a special investigator. He was to ensure that a true correlation between money and functional need existed throughout post. To break with bureaucratic precedent, COL Bryla tried to change the budget planning process at the directorate and

³² MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996.

³³ Directorate of Resource Management, ATZK-RMD, Input for 1996 Annual Command History, April 25, 1997, p.3.

³⁴ Dr. Robert S. Cameron, Interview with Chief of Staff COL Jerry L. Veach, September 6, 1996.

³⁵ Directorate of Resource Management, ATZK-RMD, Input for 1996 Annual Command History, April 25, 1997, p.3.

³⁶ Directorate of Resource Management, ATZK-RMD, Input for 1996 Annual Command History, April 25, 1997, p. 4.

³⁷ Dr. Robert S. Cameron, Interview with Chief of Staff COL Jerry L. Veach, September 6, 1996.

³⁸ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 13, 1996; Notes of Coordination Meeting, June 25, 1996.

³⁹ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 13, 1996.

command level. Instead of planning the coming fiscal year by making minor adjustments to the preceding year, he wanted budget planning for each organization to reflect accurately its needs. He carried the commander's instructions to determine precisely what readiness state Fort Knox needed to support the reduced training load. Rather than maintain large stockages of equipment from year to year, the excess would be used to negotiate additional resources necessary in high priority activity areas. COL Bryla's investigation, however, stirred further fears of resource loss that General Maggart tried to allay by personal intervention.⁴⁰

Such fears at the director level did not deter the commander from his reengineering efforts. The nature of the organization on post did, however, complicate them. Fort Knox's authorized structure had little bearing upon the manner in which it conducted business. Over time it had been modified repeatedly to accommodate change and additional taskings. In the process it strayed from its initial intent. The lines of responsibility between post components became blurred. Functions migrated between directorates and commands, and many of them could not now be easily associated with a single office. Tracing personal responsibility proved even more problematic. A confused rating system and uneven efficiency among key people tended to encourage the accumulation of tasks by those considered most competent.⁴¹ General Maggart sought to realignment the post organization with its authorized functions, eliminating duplication of effort and overlapping responsibilities in the process. He expected these changes to occur without the loss of people through reductions in force. Fort Knox's annual rate of voluntary departure of 150 people per year absorbed those individuals who might otherwise have been forced out of a job.⁴²

A series of reorganizations resulted. General Maggart consolidated the oversight of post administrative actions, including G3/DPTM and the TAQ office, under the Chief of Staff. He refocused the DCG exclusively upon the Armor School.⁴³ Responsibility for doctrine development, scattered among the Armor School, the Battle Lab, and 16 CAV, became the exclusive focus of a new directorate created in April 1996: the Directorate of Training and Doctrine Development.⁴⁴ The two new directorates of Human Resources and Business Operations emerged, absorbed the Directorate of Community and Family Affairs. Each one represented a consolidation of principal functions. In response to General Maggart's invitation, TSM XXI also established itself on post.⁴⁵

Realignment did not occur without resistance. For example, in May 1996 all budget offices except that of G3/DPTM and the Armor School merged and collocated with DRM. This action seemed to eliminate the duplication of effort and resources that resulted from each organization maintaining its own budget office in addition to DRM.⁴⁶ The Program Management Division of G3/DPTM, however, had resisted consolidation for several years. Its members believed that this reorganization offered minimal long term savings, resulted in a loss of budget expertise within the directorate, and reduced the director's control over financial matters directly linked to his mission accomplishment. Moreover, PMD noted that Fort Benning had been the only major installation to attempt a similar consolidation. It had since returned to its original, decentralized organization.⁴⁷ However, in 1997 these objections were overruled, and DRM absorbed the remaining resource management functions in G3/DPTM and the Armor School.⁴⁸

⁴⁰ Notes of Coordination Meeting, July 3, 1996.

⁴¹ Dr. James W. Williams, Interview with MG Lon E. Maggart, December 5, 1995, p. 10.

⁴² Dr. Robert S. Cameron, Interview with Chief of Staff COL Jerry L. Veach, September 6, 1996.

⁴³ Dr. James W. Williams, Interview with MG Lon E. Maggart, December 5, 1995, pp. 10-11.

⁴⁴ MG Lon E. Maggart, "Directorate of Training and Doctrine Development," briefing slide, July 1996, in Doctrine Development section of "Fort Knox Briefings for General Reimer CSA."

⁴⁵ Dr. James W. Williams, Interview with MG Lon E. Maggart, December 5, 1995, pp. 10-11; CPL Cassandra Bender, "Budget Cuts Force Consolidation," Inside the Turret, September 26, 1996, p. 1.

⁴⁶ Directorate of Resource Management, ATZK-RMD, Input for 1996 Annual Command History, April 25, 1997, p. 3.

⁴⁷ "Shaping the Garrison," Briefing slides, June 16, 1994, in 1997 Annual Command History Files, G3/DPTM-PMD-DRM Consolidation Background Folder.

⁴⁸ Deputy Commanding General BG Clayton E. Melton, ATZK-RMM, "Resource Management Consolidation," memorandum, January 6, 1997, in 1997 Annual Command History Files, G3/DPTM-PMD-DRM Consolidation Background Folder.

Limited organizational realignment, however, was not the end state desired by General Maggart. Matching organizations with functions and eliminating duplication of effort represented only the first step toward major restructuring. The final step grouped post operations into eight major areas, or subsystems. These subsystems included: Resource Management; Business Operations; Information Management; Readiness, Training Support and Mobilization; Public Safety; Human Resources and Administrative Services, Logistics, Engineering, and Environment; and Acquisition. Based upon the function review these subsystems represented the principal BASOPS activities and each roughly corresponded to a directorate. The breakup of DCFA into DHR and DBO resulted in the emergence of two of these subsystems as new directorates. Realizing the Logistics, Engineering, and Environment subsystem, however, required merging the existing DPW and DOL.⁴⁹ Such consolidation proved too unpopular, radical, and complex to implement. Inspiration for the subsystem concept came from TRADOC. TRADOC reengineering plans included grouping TRADOC schools by basic battlefield functions.⁵⁰

Several other actions that effected the daily activities of Fort Knox were also planned to realize cost savings. The entire headquarters planned to relocate from Building 1101 to Building 1002 in March 1997, permitting a consolidation of the leadership in one place. Such consolidation was expected to realize \$1 million in savings annually by reducing the need for GSA vehicles and drivers to transport the leadership across post to attend conferences. This savings would more than pay for the necessary renovations to the new headquarters building.⁵¹ The post also declared a "War on Excess" that tried to identify equipment and supplies above those items authorized and/or necessary for current activities. Such surplus represented a waste of resources, since it required storage and maintenance. Responsibility for directing this "war" lay with DOL.⁵²

Fiscal responsibility, however, could not protect Fort Knox from external actions effecting its funding. TRADOC, for example, faced the same balancing act of resources against mission as Fort Knox. Just as General Maggart sought to shuffle resources to meet needs and realize efficiencies, TRADOC reduced the funds available to certain installations to pay bills elsewhere, sometimes without warning. In 1996 General Maggart had managed to build a savings of \$12.9 million that could be applied to the current or future needs of Fort Knox. It represented a safety net for the post. To meet its own pressing obligations, however, TRADOC took these funds, replacing only a fraction of them.⁵³

Personnel Management

The functions review and the study undertaken by COL Bryla provided information on Fort Knox's fiscal and personnel status. It reflected General Maggart's intention to move people and money to realize his vision. This data became part of a personnel database that determined the allocation of personnel among existing organizations and tasks. It indicated that the post was overstaffed by 169 people, yet individual organizations suffered from major shortfalls in personnel. General Maggart sought to redistribute the available personnel to eliminate these shortfalls.⁵⁴

Shuffling the workforce also meant redistributing the workload. He wanted to assist his directors and commanders by distributing the workload evenly throughout the post. He was especially concerned that downsizing meant fewer people working longer days, a work pattern with which he disagreed. Instead he

⁴⁹ MG Lon E. Maggart, "Notional End-State Subsystems," briefing slide in BASOPS section of "Fort Knox Briefings for General Reimer CSA," July 1996; MG Lon E. Maggart, "Notional Business Operations Subsystem," briefing slide in BASOPS section of "Fort Knox Briefings for General Reimer CSA," July 1996.

⁵⁰ Tami Terella-Faram, "TRADOC Chief Proposes 'Cluster' Concept for Army Centers and Schools," *Inside the Army*, May 6, 1996, pp. 1, 16-17.

⁵¹ Dr. Robert S. Cameron, Interview with Chief of Staff COL Jerry L. Veach, September 6, 1996.

⁵² Director of Logistics Nancy H. Gilmore, ATZK-DLS-M (710), "War on Excess," memorandum, 12 August 1996.

⁵³ Notes of Coordination Meeting, September 12, 1996.

⁵⁴ Notes of Coordination Meeting, June 25, 1996.

believed that through better management of resources, the workforce could avoid being overworked and continue to complete basic missions in a timely fashion. He had no objection to using private contractors, if their services would generate a cost savings and free personnel for use in more critical tasks. Yet only through precise recording of personnel, tasks performed, and related cost could a useful comparison with contracting services be made.⁵⁵

The commander's personnel management plan involved more than matching personnel to tasks. In order to conduct those tasks effectively, people had to be empowered with sufficient authority to make decisions. He wanted people to accept responsibility for their actions and actively engage in problem-solving without overreliance upon the bureaucratic process. He believed that empowerment would promote intellect, creativity, and innovation. The result would be actions taken because they were correct and not simply because they conformed to a regulation. General Maggart feared that too much dependence upon established policies made the workforce prone to amplifying obstacles to progress. ~~Workers~~ had to have instilled in them a sense of participation in the broader plans for Fort Knox, rather than just follow orders. High performance units did not comprise automatons.⁵⁶

He encouraged involvement through establishment of the Fort Knox Excellence Pin in May 1996. This award recognized groups or teams of military or civilian personnel who contributed to the improvement of Fort Knox. Between June and December 18 teams comprising 236 individuals had received the award. The emphasis given to team efforts symbolized General Maggart's emphasis upon building cohesion in the workforce. Only through cooperation in a team effort could personnel receive the award.⁵⁷

His leadership style embraced decentralization. Comparing centralized and decentralized organizations, he noted:

One can achieve results in either a centralized or decentralized operation. It's just that when you operate from a centralized management perspective, you can only operate at the speed of one brain. But if we do it in a decentralized fashion, then the organization is operating at the speed of everyone's brain.⁵⁸

Decentralization coupled with increased connectivity promoted interaction among the workforce. New ideas resulted. The AWWG exemplified the results that could be achieved. Formed in 1994 while General Maggart served as Deputy Commanding General, the organization brought together academics, officers, noncommissioned officers, and Army civilians to analyze issues relevant to the Mounted Force's transition to Force XXI. The organization provided a forum for the free exchange of ideas and influenced doctrinal development. As members left Fort Knox for other assignments, they continued to share new ideas via electronic mail. The organization continued to provide new ideas for General Maggart after his promotion to command of the USAARMC and Fort Knox. Described as a zero cost, virtual organization the AWWG represented the potential benefits of a decentralized organization with an empowered workforce.⁵⁹

Empowerment did not occur rapidly or without opposition. General Maggart attributed this slowness to the sudden shift away from a highly centralized environment in which middle management found itself effectively cut from the decision-making process. Now asked to make decisions on their own authority with little experience, they required time to adjust to the new working environment. Through personal example he tried to allay lingering fears in the workforce of reprisals to individuals who made honest but critical reports to the senior leadership. He acknowledged that some individuals would never make the

⁵⁵ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, p. 5; Notes of Coordination Meeting, September 12, 1996.

⁵⁶ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, pp. 3-5, 14.

⁵⁷ Office of Total Army Quality, 1996 Annual Command History Input, undated.

⁵⁸ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, pp. 3-4.

⁵⁹ Dr. John W. Cranston, "United States Army Armor Center and Fort Knox Annual Command History 1994," 1996, pp. 43-45; Dr. Robert S. Cameron, Interview with Chief of Staff COL Jerry L. Veach, September 6, 1996.

adjustment, but he believed that much of the workforce had made the transition to a more open, empowered workplace.⁶⁰

Total Army Quality and Army Performance Improvement Criteria

When Army Chief of Staff General Sullivan directed the Army to adopt the practice of business-process reviews, he personally led the adoption of the Army Performance Improvement Criteria (APIC) as the new way of doing business. This top-driven initiative to change the climate within the institution offered an opportunity to exploit the increasing flexibility provided by the emphasis upon reinventing government.⁶¹ TRADOC's designation as a reinvention center and the emergence of its 1995 Strategic Plan followed, providing direct stimulation for change at the post level.

General Maggart embraced radical changes, especially to generate efficiencies in the operation of Fort Knox. The ongoing trends within the Army and TRADOC only reinforced his desire to rapidly posture the post to be cost effective and remain financially solvent. He simultaneously undertook reengineering, outsourcing, reinvention, privatization, reorganization, determination of key goals and objectives, and restructuring. The Army Performance Improvement Criteria and TAQ methods, however, proved the critical integrating linkage between these separate efforts.⁶² APIC stressed management improvement.

APIC was the cornerstone of the Army Communities of Excellence Award Program. This program recognized excellence in mission support and facility management. In 1995 it adopted a new set of criterion based upon the Malcolm Baldrige Award first implemented in 1988 to promote total quality management in government. APIC became the standard against which installations competed in the ACOE program. Each post submitted applications that addressed the areas of Leadership; Information and Analysis; Strategic Planning; Human Resource Development and Management; Process Management; Business Results; Customer Focus and Satisfaction. For each area they also indicated how improvements would occur. The applications underwent TRADOC review. TRADOC selected the most promising applications and recommended them to HQDA for consideration as candidates for the ACOE award. HQDA then selected several posts for site visits that provided a detailed review of the installation's operation. From its applicants and review results HQDA determined the winner of the ACOE award and the best representative of the excellence in performance and management that the Army sought to promote.⁶³

Fort Knox's first ACOE effort in 1995 provided useful experience in the application process. Although the post was not selected for a site visit, the payoff lay in the organization and assessment of Fort Knox's business practices that resulted.⁶⁴ The application process represented a self-assessment of the post using APIC. It focused attention upon organization, business practices, and measurements of success/failure across the post. It provided the linkage between the separate efficiency-generating initiatives already underway. The information also reinforced General Maggart's efforts to determine the best allocation of resources and revive strategic planning.

The Office of Total Army Quality prepared the ACOE application and supervised the APIC self-assessment of the post. Its understanding of APIC coupled with the commander's reliance upon APIC to link the separate efficiency-generating efforts transformed the TAQ office from a sideline observer to a key player in post operations. General Maggart's support marked a dramatic rise in the office's visibility in 1995-1996. Initially formed in 1992 to promote TQM principles at Fort Knox, it focused upon four areas:

⁶⁰ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, pp. 3-4.

⁶¹ Salt River Country Strategic Plan (US Army Armor Center and Fort Knox, 10 September 1996), p. 9.

⁶² MG Lon E. Maggart, "Fort Knox Briefings for General Reimer CSA," July 1996, BASOPS Section; MG Lon E. Maggart, "Installation Management," Briefing presented at Army Management Staff College, undated.

⁶³ Dr. James W. Williams, "US Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, pp. 1-13 to 1-16.

⁶⁴ Dr. James W. Williams, "US Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, pp. 1-15 to 1-16.

customer orientation, statistical thinking, continuous improvement, and employee involvement. Through the use of statistical analysis and process action teams, it sought ways to improve post business practices and break away from a "business as usual" mentality. In 1995 the TAQ directorship became civilianized, and Alyse Roberts assumed this role, and the office became part of the commander's personal staff.⁶⁵

In the TAQ office General Maggart saw a means of managing the changes he believed necessary. He integrated the ACOE application work into the ongoing function review and strategic planning process. The APIC emphasis upon process improvement became the vehicle for measuring and changing post business practices, and the TAQ office performed a central role in reengineering efforts. Moreover, General Maggart sought to institutionalize APIC, incorporating its TQM principles and customer orientation into routine activities. APIC clarified the financial accountability for operations and equipment on post and simplified the task of determining business costs.⁶⁶

APIC principles and the influence of the TAQ office found further expression through the Executive Steering Committee. Established in November 1995, the ESC's charter included responsibility for developing long-range goals for quality improvements, establishment of the policies to effect these improvements, and provision of a forum for the exchange of ideas. Chaired by the commander, its members also included the TAQ director, the DCG, the Garrison Commander, the Armor School Director, the TAQ commander, and four members of the Fort Knox Partnership Council. The TAQ office also pledged to provide all necessary administrative support.⁶⁷ The ESC, however, was not the brainchild of General Maggart. Instead it stemmed from the USAARMC Labor Management Agreement signed in 1994 that directed the establishment of the ESC and prescribed its membership.⁶⁸

The presence of the Fort Knox Partnership Council within the ESC marked efforts to include the local chapter of the American Federation of Government Employees in the change process. In fact General Maggart courted the union in an effort to implement his vision without alienating the workforce. He considered relations with the union better than in the past. He considered adherence to the union contract, the efforts of Garrison Manager Malcolm Fogleman, and his own willingness to talk with union personnel responsible for this improvement.⁶⁹

Training and procedural issues dominated the seven ESC meetings held in 1996. Participation on a QWB required training in TAQ methods. General Maggart wanted the entire workforce placed under the jurisdiction of the QWBs, but finding sufficient trained personnel proved a problem. QWB membership, however, required training in the data analysis methods and software used to measure process activity and progress. Sufficient numbers of trained personnel did not exist for every organization to have a QWB. The TAQ office managed to train 216 QWB members in 1996, but a shortfall remained between QWB slots and trained personnel. Workshops and a series of training seminars could not fill the shortfall in one year. Nor did putting books on TQM concepts in special reserved areas in the Armor School and Barr Memorial Libraries suffice.⁷⁰

Help in training personnel in TAQ methods and APIC came from the Office of the Inspector General. Army-wide IG association with the Malcolm Baldrige criteria dated to 1993, when FORSCOM tasked the IG for an organizational analysis based upon the Baldrige criteria. The study marked the first application of the criteria at the sub-DA level, and their adoption became standard for FORSCOM. Inspired by this example and motivated by the CSA's desire to redesign the institutional army, the IG--LTC W.D. Staly--

⁶⁵ Office of Total Army Quality, "Chronological History," briefing slides, in "Overview of Activities 1990-1995" folder; MAJ Lee Redmon, "Office of Total Army (TAQ) Open for Business at FT Knox," article draft, undated, in "Overview of Activities 1990-1995" folder; MG Lon E. Maggart, "Fort Knox Briefings for General Reimer CSA," July 1996, BASOPS Section.

⁶⁶ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 13, 1996; Notes of Coordination Meeting, October 10, 1996.

⁶⁷ "Charter of the Executive Steering Committee, U.S. Army Armor Center and Fort Knox," November 21, 1995, in Office of Total Army Quality, 1996 Annual Command History Input, undated.

⁶⁸ Office of Total Army Quality, 1996 Annual Command History Input, undated.

⁶⁹ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, p. 11.

⁷⁰ Minutes of Executive Steering Committee Meeting, February 7, 1996, in Office of Total Army Quality, 1996 Annual Command History Input, undated.

offered to serve as an APIC/TQM consultant on Fort Knox.⁷¹ The IG would create a Fort Knox Examiner Team operating on a one-year cycle to identify strong and weak areas in the post's business practices. It would teach and train personnel, and offer guidance on improvement to specific organizations.⁷²

This action appealed to General Maggart. He endorsed the concept in 1996 and dubbed the IG's office "Thunderbolt Lab" to denote its nontraditional duties. IG personnel began to receive training in APIC/TQM principles and the use of team management. The latter emphasis reinforced the importance the commander attached to building cohesion in the workforce. Once trained, IG personnel then offered to educate interested personnel in other post organizations. Reactions to the IG initiative were mixed. While DOL requested this training in its efforts to implement the concepts embraced by General Maggart, other organizations proved leery of the IG operating outside of its traditional lane.⁷³

In its new role the IG focused upon customer management, measuring leadership effectiveness, and "Azimuth"--the evaluation of leader effectiveness. Customer management required building a database that would permit statistical analysis of customers and their requirements. The results supported the functions review, ACOE, and strategic planning. The IG received favorable feedback regarding its customer management initiatives, but its actions in the leadership realm proved less popular, because of the subjective nature of measuring and assessing leadership.⁷⁴

Salt River Country Strategic Plan

In 1996 strategic planning at Fort Knox continued to build upon the efforts begun the previous year. It reflected the trickle-down impact of a Congressionally-directed, reassessment of processes in federal government. Key driving forces included the Government Performance and Results Act of 1993 [Public Law 103-62] and the Government Management Reform Act of 1994 [Public Law 103-356]. The first aimed to improve public confidence in government by focusing on results, quality of service, and customer satisfaction. It required federal agencies to undertake strategic planning and measure performance. It also directed that all federal agencies submit a five-year strategic plan, linked to a five-year performance plan with specific measures of performance, no later than FY97. The Government Management Reform Act of 1994 [Public Law 103-356], dealt mainly with consolidating reports. Both laws reflected a stream of legislation to increase accountability and improve the efficiency of government operations.⁷⁵ They also spurred the strategic planning process at Fort Knox.

The Salt River Country Strategic Plan provided a long-term plan to posture Fort Knox for the future. It provided a single source for guiding change, and it incorporated all of the reengineering initiatives underway to style Fort Knox's management structure and operation like a private sector business. The determination of goals, objectives and tasks; the functions review; the establishment of the ESC and QWBs; the IG's customer satisfaction analysis; the use of measurement tools like ABC, SBC, and the installation status report; and APIC all represented pieces of the strategic plan.⁷⁶ It would serve as a roadmap for the post during the Army's transition to a 21st century force between 1997 and 2010. By providing a focus for future development, it permitted the senior leadership greater flexibility to focus upon implementation of specific tasks in the near-term. Completion of these tasks in turn represented coordinated milestones in the execution of the strategic plan.⁷⁷

The plan addressed at the post level the Army's basic dilemma of modernizing with limited funding. Budget constraints placed a premium upon proper use of resources. Consequently, TRADOC planned to

⁷¹ Dr. Robert S. Cameron, Interview with MAJ D.S. Garic, IG Office, October 2, 1996.

⁷² Notes of Executive Steering Committee Meeting, August 22, 1996.

⁷³ Dr. Robert S. Cameron, Interview with MAJ D.S. Garic, IG Office, October 2, 1996.

⁷⁴ Dr. Robert S. Cameron, Interview with MAJ D.S. Garic, IG Office, October 2, 1996.

⁷⁵ Fact sheet, ATZK-CS, Dr. Jim Maguire, Installation Reinvention Coordinator, 6 June 1996, subject: Reinvention in the Law.

⁷⁶ Dr. Robert S. Cameron, Interview with Chief of Staff COL Jerry L. Veach, September 6, 1996; MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996.

⁷⁷ USAARMC, "Salt River Country Strategic Plan," draft, September 10, 1996, pp. 1-2.

stabilize its organizations and assess their activities. The results would permit consolidation of function and elimination of low payoff operations. General Maggart's emphasis upon reviewing functions, assessing performance, and reengineering mirrored this emphasis but with considerably more zeal.⁷⁸ He sought the **rapid** assessment of post operations simultaneous with emplacing improvement measures and preparing the strategic plan. Implicit in the plan and its development lay an emphasis upon future over current needs. Such emphasis at times undermined its marketability.

The Commander's Perception of Success

Hectic activity characterized General Maggart's short eighteen-month tenure as commander. To him, however, the work paid off. Upon his retirement he looked back upon a range of successes throughout the Armor Center. The Army and TRADOC seemed to agree with this assessment. The post received an award for the best master planning and a TRADOC award for excellence in contracting. This award specifically addressed the upgrading of facilities, television production, and Hot Loop XXI.⁷⁹

For someone dedicated to team building, the prevailing image of small-groups of people tackling projects suggested accomplishment. The flood of favorable correspondence further indicated that people were comfortable in their environment--a necessary condition for a high-performance unit. He acknowledged that some individuals never accepted his plans and efforts, but he believed that the bulk of the workforce was pleased. People seemed to support his work at creating a work environment that at once was more productive, efficient, and rewarding.⁸⁰

He listed the empowerment of people to enhance creativity and productivity among his most important achievements.⁸¹ As an example he appointed Peter Anrysiak as head of the new Directorate of Business Operations because of his support of the concepts and goals of the reengineering process. Empowerment seemed to drive DOL's Nancy Gilmore, who received promotion to GS 15 because of her successful implementation of TQM, a QWB, and PATs. She also received the John Macy Award for being the top civilian manager.⁸² The decreasing rates of domestic violence and alcohol-related accidents suggested that the efficiencies in organization and processes were producing positive results acceptable to the workforce.⁸³ Moreover, the Army Ideas for Excellence Program generated a flood of suggested improvements from all levels of the workforce and resulted in total tangible benefits of \$251,000.⁸⁴ Decreasing stress and frustration among the workforce and its willingness to think about constructive change in the workplace suggested considerable progress toward establishment of the high performance unit General Maggart wished to create.

Quality of life enhancements also seemed to be working. To provide adequate support for the families of soldiers, especially when they deployed overseas, the Army introduced Army Family Teambuilding. This program was administered by civilian and military volunteers who had first to complete instructional classes, and it received the enthusiastic support of General Maggart and his wife. By September 1996 AFTB at Fort Knox included 31 volunteers. Many more volunteers were carried on waiting lists for the mandatory classes. Among its support services child care remained the most demanded. Demand in fact outstripped the capabilities of AFTB. Overall the program appeared popular and carried a minimal cost to the post.⁸⁵

⁷⁸ USAARMC, "Salt River Country Strategic Plan," draft, September 10, 1996, pp. 10-12.

⁷⁹ MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996.

⁸⁰ MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996; Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, pp. 3, 8-9.

⁸¹ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, October 11, 1996.

⁸² Notes of Coordination Meeting, October 10, 1996.

⁸³ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, pp. 8-9.

⁸⁴ Directorate of Resource Management, ATZK-RMD, Input for 1996 Annual Command History, April 25, 1997, p. 5.

⁸⁵ MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996; Notes of Coordination Meeting, September 12, 1996.

The real measure of success, however, lay in finances. General Maggart sought to provide the post with a solid fiscal foundation for a future characterized by budgetary constraints. He believed that the budget management system emplaced during his tenure provided for future efficiency. It would prevent the post from being "whiplashed by the system."⁸⁶ The post did not appear to suffer from his actions. Between FY 95 and FY 96 actual TRADOC Operations and Maintenance, Army funding rose \$14.6 million to \$215.1 million. This increase included a BASOPS Leveraging and Development Grant primarily for its hazardous material management system. General Maggart also consistently volunteered Fort Knox to be the pilot organization for new concepts and ideas. Pilot programs brought additional funding and kept the post in the limelight of TRADOC activities. In FY 96 TRADOC provided \$20 million as a Key Enabling Investment to develop 21st century technology and authorized \$7.9 million in OMA funds for Fort Knox's Force XXI Training Program. Year-end funding included \$2.901 million, most of which went to Garrison Command in part to fund post reengineering.⁸⁷

The FY 97 budget also reflected Fort Knox's ability to secure funding through experimentation and modernization. TRADOC OMA funding fell by \$48.3 million, but this figure reflected Fort Knox's receipt of funds through other sources and activities. Such sources included for example a KEI for digital technology, receipt of a BOLD grant, BRAC funds for Fort Knox's activities related to the closure of Fort Benjamin Harrison, and \$1.4 million for its war on infrastructure. The infrastructure war sought to consolidate operations in the best facilities and destroy the excess.⁸⁸

When General Maggart retired, he considered the hard work necessary to realize his vision and ensure the future fiscal viability of the post to be done. His successor had merely to let the processes in place function. He believed his policies would long outlast his presence, since the simple business logic inherent in them would discourage successors from fundamental redesign. An iron logic would make the value of them obvious to succeeding commanders.⁸⁹

A New Commander, A New Vision

When MG Harmeyer became the new USAARMC commander, no radical changes occurred. His command philosophy embraced teamwork, zero discrimination, and an expectation of competency among subordinates. He intended to build upon the actions of his predecessors, sustaining strengths and improving weaknesses.⁹⁰ His low key approach to post operations in his first months as commander helped to dispel concerns among the workforce that another major reengineering effort was imminent. Their work in 1995 and 1996 would not be undone.

General Harmeyer's initial involvement in business affairs focused upon refinement rather than deconstruction. He did not jettison any of the key organizations painfully built under General Maggart. He did begin focusing post activities more sharply. The thirteen goals pursued simultaneously, sometimes resulting in a dispersion of effort, he reduced to six (see Figure 2.4). This concentration clarified the areas of main effort. APIC remained the cornerstone of improvement and measuring progress, ensuring that the TAQ office continued to play an important role in the strategic planning process. QWBs and PATs continued to address specific processes within directorates and commands. To remedy the weakness in monitoring progress toward the established goals, he considered a proposal of the new Armor School Director COL Richard Geier. The latter recommended creating three strategic planning committees for this task.

⁸⁶ Notes of Coordination Meeting, June 20, 1996.

⁸⁷ Directorate of Resource Management, ATZK-RMD, Input for 1996 Annual Command History, April 25, 1997, pp. 1-2.

⁸⁸ Directorate of Resource Management, ATZK-RMD, Input for 1996 Annual Command History, April 25, 1997, pp. 2-3.

⁸⁹ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 6, 1996; MG Lon E. Maggart, "Fort Knox Update," briefing, September 10, 1996.

⁹⁰ Dr. Robert S. Cameron, Interview with MG George H. Harmeyer, March 3, 1997.

What did change was the shift back toward a centralized organization. General Maggart openly criticized such structures and encouraged the growth of groups outside the traditional hierarchical organization. The composition of such groups reflected diversity, exemplified by the AWWG. The new commander pursued a more conventional approach. The coordination meeting became the Command and Staff meeting with participation reduced to key commanders and directors, mostly military. Post management followed the chain of command. Staffs made recommendations to their commanders who made a decision that the staff then implemented. Disappearing were the numerous independent committees that had existed to promote consensus. Consensus would now flow from the top down with staff coordination addressing the administrative details and providing the crosstalk necessary to ensure cohesion and unity of effort.

Figure 2.3: General Harmeyer's Goals

- Maintain Fort Knox and the United States Armor Center as the U.S. Army's center of excellence for training mounted soldiers and leaders as members of the joint/combined arms team for successful mounted ground combat operations on today's battlefields and those of the Twenty-first Century.
- Modernize the mounted force.
- Provide support to the EXFOR.
- Continue to develop the Force XXI Training Program
- Deployable, combat ready mounted forces will continue to be an indispensable part of our national military strategy into the foreseeable future. To support this, Fort Knox/USAARMC must continue to be a flexible, affordable institution capable of expanding or contracting to execute all of our core competency and contingency missions to meet the needs of the Army and the nation today and in the future.
- Maintain community of excellence standards.

CHAPTER 3 SYNOPSIS

This chapter shows how the changes implemented by General Maggart affected the various directorates and commands that make up BASOPS. The chapter focuses upon **key** trends and events to illustrate attempts to realize the commander's vision.

Chapter 3: BASOPS: Coping With Change

Army-wide trends inspired General Maggart's vision and drove his reengineering effort. These trends focused upon changing the Institutional Army. Each change sought cost savings to help fund modernization. The end of President Carter's term in office and the early phase of President Reagan's administration witnessed a large increase in Defense spending that permitted the fielding of a new generation of weapons. A spending holiday followed in which matériel funding dwindled. By 1996 the Army needed to develop the next generation of equipment, but the budget environment had become hostile.¹ Partially through reengineering the Institutional Army, the military hoped to create cost savings large enough to meet modernization needs. These cost saving actions included greater reliance upon the private sector, consolidating personnel management and Army Reserve Pay Offices into regional centers, and expanded automation to track and process data.²

Cost saving actions, however, had to be balanced against efforts to maintain a high quality of life for military personnel and their families. President Clinton supported a plan first recommended by Secretary of Defense William J. Perry in 1995 to improve pay, housing, and family support. Implementation of this plan continued in 1996.³ The Army also had to fulfil its responsibilities for environmental stewardship to ensure access to training areas, provide a clean and safe environment for soldiers and their families, and prevent pollution.⁴

General Maggart incorporated this quality of life emphasis into his vision. The post directorates and commands in turn tried to apply it to the administrative and financial realities at Fort Knox. In 1996 this process occurred simultaneously with reorganization, the functions review, the ACOE effort, chartering QWBs, creating PATs, and building the strategic planning process. To many employees Fort Knox, these activities were spreading the personnel and financial resources of the post too thinly for uncertain results. Worse, a series of financial problems threatened the post's club system.

Reorganization

General Maggart sought a cost savings by aligning organizations and functions. The BASOPS Strategic Planning Group played a key role in this restructuring. In May 1996 the Group was created to do quick studies of organizational and operational issues for the Garrison Command. Its members comprised people temporarily assigned from the directorates grouped in the Garrison Command. However, no specific dates for their return were ever established, and the Group acquired a permanent status. It became a node of intellectual activity that used reengineering tools and concepts to determine the most effective BASOPS organization.⁵

The BASOPS Strategic Planning Group influenced post reorganization. It developed a model to guide reorganization within the Garrison Command. This model grouped the basic functions of the Garrison

¹ Washington Post, "Defense Pork and Posturing," in Early Bird, July 2, 1997, p. 16.

² Chief of Army Reserve Major General Max Baratz, "Ready and More Relevant Than Ever: A Restructured Army Reserve," Army Greenbook 1996-1997, (October 1996), pp. 103, 107; Assistant Secretary of the Army for Manpower and Reserve Affairs Sara E. Lister, "Maximizing the Army's Most Important Asset--People," Army Greenbook 1996-1997, (October 1996), p. 40.

³ Secretary of Defense William J. Perry, "Annual Report to the President and the Congress, March 1996," Chapter 5, p.1, internet source: http://www.dtic.mil/execsec/adr96/chapt_5.html.

⁴ Secretary of Defense William J. Perry, "Annual Report to the President and the Congress," March 1996, Chapter 15, pp. 1-2, internet source: http://www.dtic.mil/execsec/adr96/chapt_15.html.

⁵ Sara Roop, "BASOPS Strat Planning Group Background," July 8, 1997, electronic mail note; Fort Knox Home Page, Garrison, BASOPS Strategic Planning Group, "BASOPS Strategic Planning Group," pp. 1-2; Fort Knox Home Page, Garrison, BASOPS Strategic Planning Group, "Reengineering Process," pp. 1-2.

Command into "Notional End-State Subsystems."⁶ It suggested how major reorganization might occur and reinforced General Maggart's reengineering efforts. For example, the Logistics, Engineering and Environment Subsystem helped to justify consolidating the maintenance activities of DPW and DOL. A joint DPW and DOL QWB reviewed merging the separate supply and maintenance activities of these organizations. Although DOL absorbed DPW's Supply and Storage Division, the QWB concluded that a broader consolidation would not create significant savings.⁷

The individual organizations of the Garrison Command also sought internal efficiencies. The Directorate of Contracting, for example, reorganized itself in 1996. Reduced resources, a changing contracting climate, and the need to meet a mandatory employee/supervisor ratio contributed to the reorganization. The directorate shrank from five divisions to three. DOC also planned for future reclassification of some of its small purchase employees to increase contracting support. This support reflected the Army's increased reliance upon private contractors for labor and services.⁸

A major reorganization within the Garrison Command resulted in the creation of the new Directorates of Business Operations and Human Resources from elements of five existing directorates. The new directorates resulted from the first application of reengineering concepts to a major post organization--DCFA.⁹ Prior to 1996 DCFA had grown into large organization responsible for family support services, health and fitness programs, ACAP, and all MWR functions.

In February 1996 the Garrison Command recommended splitting DCFA into two directorates: one controlling its non-appropriated fund (NAF) business activities and one for its soldier and family support activities. Formal proposal of the plan occurred at the senior leadership's off-site meeting in March. The plan would permit simplified management and support of NAF activities, which Army cutbacks in funding had made more difficult to sustain. These activities included those businesses such as the clubs and the golf course that provided services to the post and surrounding communities. Together with DPW's Housing Division, they would be concentrated in the Directorate of Business Operations.¹⁰ DCFA's people and family support activities, the Adjutant General's military personnel, and G3/DPTM's ACES would comprise the Directorate of Human Resources. The proposed arrangement offered the potential for cost efficiencies and allowed each directorate to focus upon one particular function: business operations or human resources.¹¹

Moreover the proposal coincided with CPO regionalization. Spurred by Vice President Gore's National Performance Review and the resulting government-wide efforts to provide services using a smaller, more efficient structure, the Department of Defense approved Department of Army's plan to regionalize Civilian Personnel Offices. In 1994, DA established ten regions to provide personnel servicing world-wide. The regionalization concept provides for a regional Civilian Personnel Operations Center to process personnel actions, maintain official records and recruit for positions. Each installation in that region will retain only a small Civilian Personnel Advisory Center instead of an entire directorate. Fort Knox applied to become the regional office for the South Central Region. If successful the post would have gained 250 new positions, but Redstone Arsenal in Huntsville, Alabama, was selected instead. Fort Knox's CPAC became part of DHR.¹²

⁶ COL Douglas M. Harris, "DCFA Reorganization & 1st Increment--Garrison Reengineering," Decision briefing slides, September 6, 1996; MG Lon E. Maggart, "Notional End-State Subsystems," briefing slide in BASOPS section of "Fort Knox Briefings for General Reimer CSA," July 1996.

⁷ Directorate of Public Works, 1996 Annual Command History Input, May 5, 1997, Enclosure H; Civilian Personnel Office, "Garrison Realignment," Civilian Personnel Newsletter, CP10-96, November 1996, p. 2.

⁸ Directorate of Contracting, 1996 Annual Command History Input, February 3, 1997.

⁹ COL Douglas M. Harris, "DCFA Reorganization & 1st Increment--Garrison Reengineering," Decision briefing slides, September 6, 1996.

¹⁰ Dr. Robert S. Cameron, "DCFA Trends in 1996," memorandum for record, July 11, 1997, p. 1.

¹¹ COL Douglas M. Harris, "DCFA Reorganization & 1st Increment--Garrison Reengineering," Decision briefing slides, September 6, 1996.

¹² Directorate of Human Resources, 1996 Annual Command History Input, "Civilian Personnel Office Regionalization," undated; Directorate of Human Resources, 1996 Annual Command History Input, "Civilian Personnel Regionalization South Central Region," Proposal, September 22, 1995; Civilian

On October 7, 1996 the new directorates became active. While DHR consolidated responsibility for personnel issues, DBO concentrated NAF business activities and DPW's Housing Division.¹³ All money-generating programs now resided in one place.¹⁴ General Maggart appointed Peter Andrysiak to lead DBO in recognition for his services that the commander considered an outstanding example of empowerment. DHR concentrated all personnel services under the leadership of Sam Jones, the ex-head of CPO until its regionalization. Figures 3.1 and 3.2 show the layout of each new directorate.

A Hierarchy of Excellence

The ESC governed a hierarchy that focused upon process improvement within the directorates and commands. It also bore responsibility for implementing the goals, objectives, and tasks associated with General Maggart's vision (see Figure 3.3). The ESC made basic policy decisions to accomplish the goals. Three ESC subcommittees bore responsibility for monitoring progress in key activity areas: BASOPS, Training, and Futures. The head of each subcommittee reflected its particular concern. The Garrison Commander headed the BASOPS subcommittee, the Armor School Director headed Training, and the DCG headed the Futures subcommittee.¹⁵

Beneath the ESC and its subcommittees lay the Quality Workforce Boards. Each QWB possessed a charter granted by the ESC. Changes in the charter required the action of the TAQ office and the the Fort Knox Partnership Council.¹⁶ Each directorate and command had a QWB associated with it. It was to comprise no more than ten members, including at least one representative of the Labor Management Partnership Council. The existence, structure, and operation of the QWBs fulfilled Article 18 of the Labor Management Agreement.¹⁷

Each QWB focused upon improving its parent organization and reported quarterly to the ESC. QWB members studied their organization's activities. They identified processes and prioritized them by their improvement potential. It also reviewed employee recommendations for process reviews. When a consensus determined that a particular process needed improvement or further study, the QWB chartered a process action team. The charter terms specified the duties and members of the PAT and provided a timeframe for completion. The PATs redesigned work processes and collected data on their performance. Upon completion of its chartered purpose, the PAT dissolved.¹⁸

Personnel Office, "CPO Regionalization," Civilian Personnel Newsletter, CP12-95, October 1995, pp. 1-2; Civilian Personnel Office, "CPO Regionalization," Civilian Personnel Newsletter, CP3-96, March 1996, pp. 1-2; Civilian Personnel Office, "Garrison Realignment," Civilian Personnel Newsletter, CP10-96, November 1996, p. 2.

¹³ COL Douglas M. Harris, "DCFA Reorganization & 1st Increment--Garrison Reengineering," Decision briefing slides, September 6, 1996.

¹⁴ Fort Knox Home Page, Garrison, Directorate of Business Operations.

¹⁵ Dr. Robert S. Cameron, ATZK-PTH, "Functions of the ESC and QWBs," Memorandum for the record, June 26, 1997.

¹⁶ Minutes of Executive Steering Committee Meeting, March 25, 1996, in Office of Total Army Quality, 1996 Annual Command History Input, undated.

¹⁷ Dr. Robert S. Cameron, ATZK-PTH, "Functions of the ESC and QWBs," Memorandum for the record, June 26, 1997; in Office of Total Army Quality, 1996 Annual Command History Input, undated.

¹⁸ Dr. Robert S. Cameron, ATZK-PTH, "Functions of the ESC and QWBs," Memorandum for the record, June 26, 1997; Office of Total Army Quality, 1996 Annual Command History Input, undated.

Figure 3.1: The Directorate of Human Resources

Directorate of Human Resources

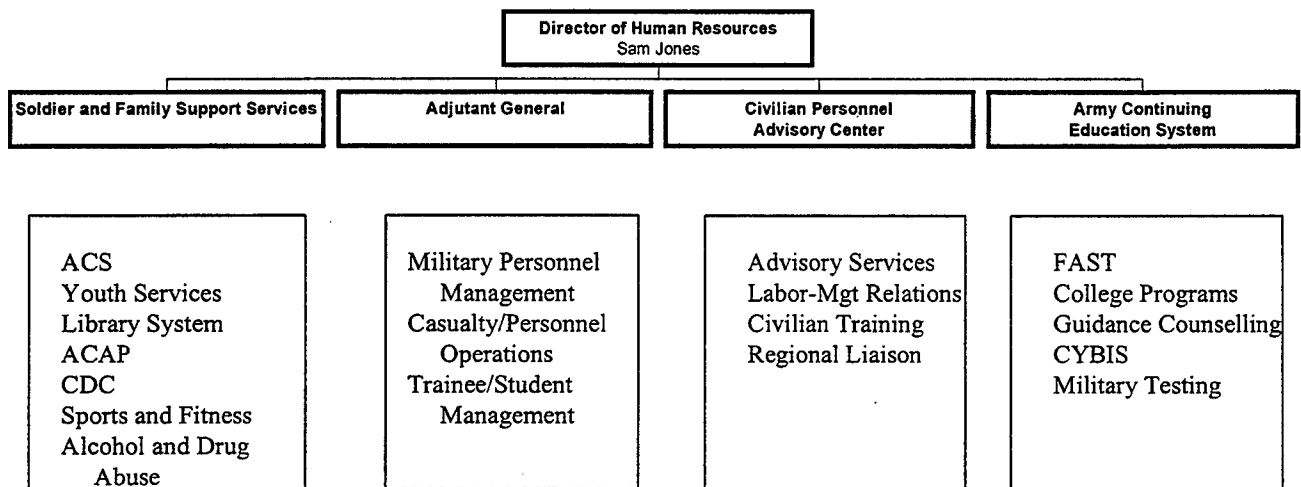


Figure 3.2: The Directorate of Business Operations

Directorate of Business Operations

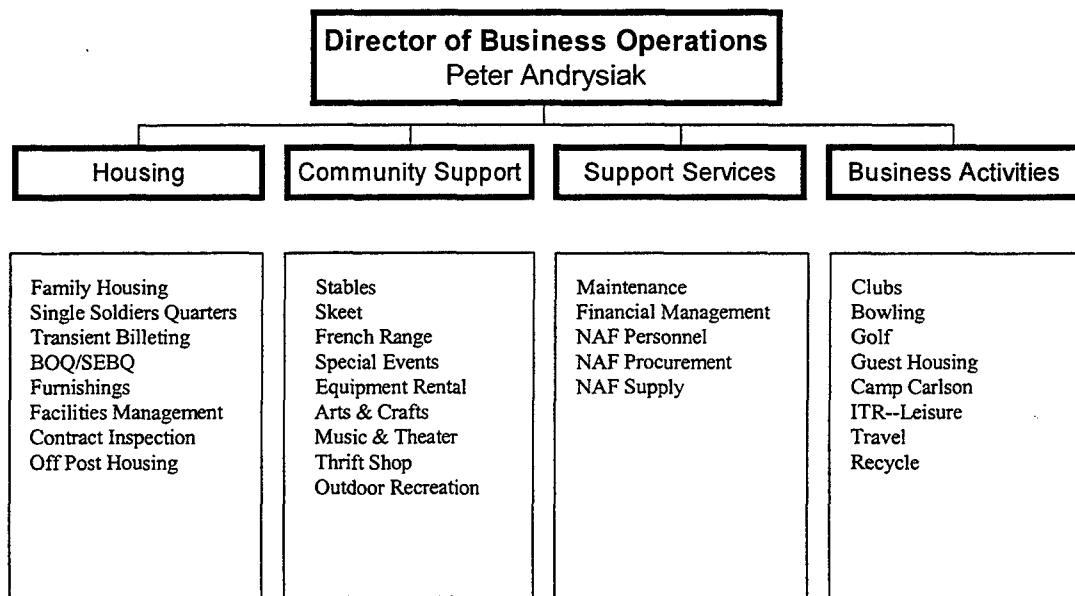
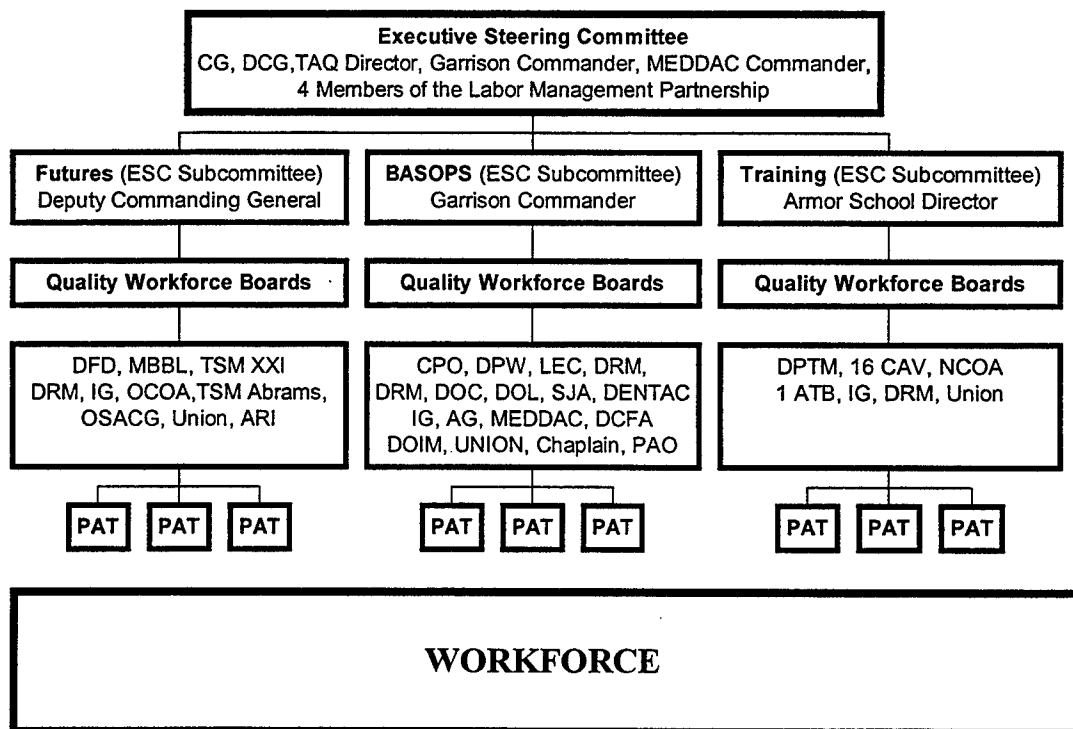


Figure 3.3: A Hierarchy of Excellence



Collectively, the QWBs and PATs tied a broad section of the workforce directly into the changes on post. Such involvement corresponded to General Maggart's desire to promote empowerment and cohesiveness among the workforce. Yet the evolution of the ESC, QWBs, and PATs occurred separately from the development of the commander's goals, objectives, and tasks. The former addressed specific business practices, while the latter became the basis of the strategic planning process. APIC, ABC, and SBC provided the resource management tools to measure the progress made toward particular goals.¹⁹

General Maggart embraced the ESC and its related QWBs and PATs as another tool to assist reengineering. He wanted to transfer the impetus for change on post from his own office to the ESC. The ESC would then promote and review the progress of change, and evaluate the overall performance of business measures. By the summer of 1996, however, he did not believe the committee yet ready to accept this responsibility.²⁰

Confusion clouded the operation of the entire hierarchy. Some QWB leaders questioned the rationale behind the organization. They objected to additional demands to repackage data presented to the ESC in a simplified format for quick review by the commander. A general concern existed about the post's ability to implement both the TAQ principles that emphasized process improvement and the commander's desired changes in the method of operation post-wide. A conflict seemed to exist that could not easily be resolved.²¹

The last ESC meeting of General Maggart's tenure focused not on progress toward the goals but upon how to make the ESC more effective. At issue was the ESC's basic membership and the failure of the ESC subcommittees to serve as links between the ESC and the QWBs. The ESC was perceived as operating in a vacuum without director or commander influence, thereby alienating them from the entire process. Directors and commanders did note, however, that association with the ESC resulted in a sharp increase in their already heavy workloads.²² From General Maggart's perspective, the ESC had failed to function as a mechanism to monitor progress toward the established goals.²³

Reducing the Functions of the Civilian Work Force

General Maggart sought to determine what functions the post actually performed. These functions were then prioritized and matched against existing resources. The results indicated those areas in which cost reductions had to be found or activities dropped. In 1996 TRADOC emphasized greater reliance upon the private sector to provide services and goods previously provided by post warehouses and government employees. The combination of these two trends resulted in several changes in post business practices and the cessation of some activities considered nonessential to the core missions of the Armor Center.

The use of outside contractors to provide goods and services to the post was not a new phenomenon. Such outsourcing, however, received much greater emphasis. Outsourcing became a way to generate cost savings that would help fund modernization at TRADOC level and reduce the cost of business at the post level. It represented a decision to acquire products or services from external sources by a service contract.²⁴ Outsourcing, however, bears a human cost in terms of those government employees whose jobs have been replaced by a contractor. In fact it is the elimination of government jobs that generates much of the potential savings.

¹⁹ Dr. Robert S. Cameron, Interview with Chief of Staff COL Jerry L. Veach, September 6, 1996; Dr. Robert S. Cameron, ATZK-PTH, "Strategic Planning Process and TAQ," Memorandum for the record, June 26, 1997; Office of Total Army Quality, 1996 Annual Command History Input, undated.

²⁰ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 13, 1996.

²¹ Notes of Executive Steering Committee, August 22, 1996.

²² Notes of Executive Steering Committee Meeting, September 19, 1996.

²³ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, October 11, 1996.

²⁴ Julie Dvorak, "Update DPW/DOL Commercial Activities (CA) Studies," article draft, undated, in DCFA Trends and Activities Folder.

In 1996 outsourcing resulted in the shutdown of Fort Knox's Troop Issue Support Activities. TISA maintained a warehouse that supplied food to the dining facilities on post. The warehouse required personnel to operate, large food supplies, and building operations costs. The post turned to a food supplies contractor to deliver food upon request directly to the dining facilities. The need to maintain and staff the warehouse disappeared. It closed and the related jobs and expenses disappeared.²⁵

In March 1996 DPW entered into a Demand Side Management contract with local utility Nolin RECC that permitted the installation to reduce its energy usage through private sector investments. In a DSM contract, a utility pays for and installs energy saving improvements and is repaid for the investment plus interest through energy savings realized. After the improvements are paid for, they and all associated energy savings belong to the installation. As a result over 1,000 new lighting fixtures and ballasts were installed together with other energy-saving modifications. The anticipated savings was 1.7 million kilowatt hours or a projected annual savings of \$106,173.54.²⁶

Some post activities proved too costly in time, labor, and money to continue even with outsourcing. The post taxi service, operated by government employees was not considered cost effective and eliminated. Maintenance work by DOL on the ground missile known as the Land Combat Support System transferred to Fort Campbell, the location of the system's principal user. The Transportation Scale House, used to weigh commercial carriers of household goods for relocating soldiers and their families, was shut down. The salary of the Scale Master was saved. DBO assumed the function, but charged a fee for it.²⁷ Budget reductions in DPW also resulted in post lawncare being scaled back. Unable to afford the necessary manpower and unwilling to divert new soldiers from their training, General Maggart ordered the posting of signs in those areas no longer to be mowed. The signs read: "Restored to Natural Habitat."²⁸

DOL also cut furniture and upholstery, and canvas repair.²⁹ DOL inherited these functions from the 194th Separate Armored Brigade upon its deactivation. Post organizations submitted their furniture or canvas items to DOL for free repair. In 1996, this service stopped. DBO's Hansen Arts and Craft Center continued to provide furniture repairs but charged a fee similar to that found off post. The Regional Correction Facility took over the canvas repair service and also charged a fee. The actual work, however, was done by the inmates, who ideally learned a marketable skill in the process.³⁰

The Physical Security Division of LEC revised USAARMC Regulation 210-17 Installation Interior Guard Duty, since downsizing had made its implementation impossible. The division also jettisoned its responsibilities to support RC units in Kentucky, Ohio, and Indiana. Some of these duties were assumed by the 81st Reserve Support Command.³¹ LEC also suffered temporary personnel losses during two separate deployments of MPs to Bosnia as part of Operation Joint Endeavor. By November 1996, however, these soldiers had returned to Fort Knox.³²

The outsourcing and reduction of nonessential services reflected a cutback in personnel and money felt throughout the Army. The reliance upon outsourcing created a need to establish a broader range of contacts in the private sector for future contracts. Conversely, some businesses remained unaware of the opportunities available at Fort Knox. The Contracting Opportunities Day, held on August 19, helped to bring businesses and Fort Knox together. The organizers for this event included: the Kentucky Cabinet for Economic Development, the U.S. Small Business Administration, the Kentucky Procurement Assistance Program, the Elizabethtown Small Business Development Center, and the Department of Defense. The

²⁵ Dr. Robert S. Cameron, "DOL Trends in 1996-1997," memorandum for record, July 9, 1997, p. 1

²⁶ Directorate of Public Works, Input for 1996 Annual Command History, May 5, 1997, Enclosure D.

²⁷ Dr. Robert S. Cameron, "DOL Trends in 1996-1997," memorandum for record, July 9, 1997, p. 2.

²⁸ SPC Rhonda Marie Jones, "Budgeting forces DPW to cut back mowing," Inside the Turret, August 22, 1996, pp. 1A, 19A.

²⁹ Dr. Robert S. Cameron, "DOL Trends in 1996-1997," memorandum for record, July 9, 1997, p. 1.

³⁰ CPL Cassandra Bender, "Furniture, canvas repair not free to installation units anymore," Inside the Turret, October 10, 1996, p. 1A.

³¹ Headquarters and Law Enforcement Command, Input for 1996 Annual Command History, Physical Security Division, January 31, 1997.

³² Headquarters and Law Enforcement Command, Input for 1996 Annual Command History, Memorandum for MAJ Smith, January 27, 1997.

event served to provide information about how a government contract is obtained and what opportunities existed at Fort Knox. The complexity of rules and regulations surrounding these contracts made such information essential to a potential contractor. Small businesses in particular were intended recipients of this information. In 1996 alone small businesses received 77.23% of all contracts awarded by the post.³³

Automation

In the post Cold War era, the Army increased its use of automation to offset the impact of downsizing in administrative staffs. Automated data management and tracking provided cost savings and generated efficiencies through software that provided improved tracking of people, money, and general data. For Fort Knox, automation became a necessity for a diminished work force facing a largely unchanged workload, especially in those organizations that dealt with personnel records.

In the case of the Adjutant General's office, this workload increased following its assumption of responsibility for processing evaluation reports for USAREC and ROTC in March 1995. The Evaluations Section, however, managed to exceed Army and TRADOC standards. The section's accomplishments led TRADOC to designate it as a test site for a new paperless evaluation reporting system. The new system is intended to decrease drastically the number of late evaluation submissions. The Retirement Services Program supports a population of 44,000 in Ohio, Indiana, Kentucky, West Virginia, and Illinois. It provides information and services to retirees and soldiers throughout this area. With only two full-time civilian personnel and three part-time assistants, the program enhanced its capabilities when it became connected to Transition Processing, a computer link that provides rapid manipulation of records and dissemination of information for soldiers entering the retirement process. Similarly, the Casualty and Mortuary Affairs Program benefited from the use of Army Casualty Information Processing System. With Fort Knox designated a Casualty Area Command, this program must provide casualty assistance, next-of-kin notification, and casualty reporting to an area spanning five states. In 1996, 414 casualty reports were filed using ACIPS.³⁴

The AG office also received Installation Support Modules (ISM) in 1996. These modules are software applications intended to standardize business functions. The ISMs were designed to automate day-to-day installation functions, share common information across functional areas, and reduce redundant input. For example, information gathered from the Standard Installation/Division Personnel System (SIDPERS) and the AG's In-processing Module (INPROC) is shared with the Education Center's Education Management Information System (EDMIS), DOIM's Personnel Locator (PERSLOC), and the Drug and Alcohol Management Information System (DAMIS). The ISMs consolidate personnel data entered into any of the linked systems, simplifying the locating and processing of personnel, whether in or leaving the Army. SIDPERS has the ability to update all ISM files simultaneously when a person's status or location changes.³⁵

In April 1996 Fort Knox received a site survey from the DA ISM Project Manager. The results directed the installation of all necessary wiring, equipment, and hardware/ software to support the ISMs. This work completed by November. The DA ISM Program Office funded the installation, including more powerful personal computers, at the cost of over \$350,000. For the AG Office, this investment represented a significant improvement to its electronic communications capability and supported General Maggart's desire to improve the internal and external connectivity of the post.³⁶

The Staff Judge Advocate's office also increased its use of computer technology to realize efficiencies. In assisting military personnel and families prepare taxes the SJA established its annual tax center. By the time the tax center ceased operation, 1577 returns had been filed electronically.³⁷ Moreover the SJA became part of a LAN that also included the Chaplain's Office, the EEO Office, and the

³³ PFC Shirley R. Potter, "Contracting forum held on post," Inside the Turret, August 29, 1996, p. 11A.

³⁴ Adjutant General, Input for 1996 Annual Command History, April 21, 1997.

³⁵ Adjutant General, Input for 1996 Annual Command History, April 21, 1997.

³⁶ Adjutant General, Input for 1996 Annual Command History, April 21, 1997.

³⁷ Staff Judge Advocate, Input for 1996 Annual Command History, May 8, 1997, p. 8 and Enclosure 15.

EO office. To function on the LAN required the installation of fiber optic cables, hubs, new computer purchases, and upgrades to existing PCs. The total estimated bill was \$343,000 spread over a multi-year period. \$30,000 was secured from the Office of The Judge Advocate General. By the end of the year the hubs and fiber optic cables had been installed and soldiers and civilians had attended a variety of computer literacy classes.³⁸

Quality of Life

In his annual report of 1996 the Secretary of Defense stressed the linkage quality of life and military readiness. Quality of life included pay, benefits, the working environment, and the living environment for military personnel. The importance attached to quality of life issues found expression in FY 95 when President Clinton added \$25 billion to Defense spending in the areas of readiness and quality of life. Of this amount, \$7.7 billion funded pay raises for military personnel through the year 2000. A further \$2.7 billion was added to future spending in the areas of cost of living, improved housing, expanded child care services, more recreation plans, and to prevent domestic violence. Furthermore, the Secretary of Defense established a Quality of Life Task Force of experts to provide recommendations to better housing and family services.³⁹ The Secretary of Defense considered quality of life issues the third Army priority after readiness and modernization. With 65% of soldiers married and 8% single parents, the family orientation of the Army remained high. Services that supported the family required attention, especially to alleviate the soldier's concern about the fate of dependents while deployed overseas.⁴⁰ These actions represented a statement of intent that found reflection at all levels of military leadership. At Fort Knox General Maggart's included a desire to make Fort Knox a great place at which to work and play.⁴¹

Family housing was the most tangible indicator of quality of life support. DPW enjoyed its largest funded program ever in FY 1996. The bulk of this program focused upon non-military construction projects, including \$23.7 million for Army Family Housing.⁴² Year-end funding provided the directorate with an additional \$27.85 million, most of which paid for services intended to improve the quality of life for soldiers and civilians on post, especially building repairs and renovations.⁴³ The effort expended in housing improvements resulted in DPW's Housing Services Branch Sandy Keefe being designated Army Housing Executive of the Year.⁴⁴

DPW also conducted a lead-based paint survey in the housing areas. The survey analyzed samplings from the exterior and interior walls as well as the soil around structures. It required 1.5 years to complete and determined that the principal remaining areas of lead-based paint are building outside walls. In response DPW prepared a program to reduce this lead-based paint. Although none of the soil samples showed a lead content above regulatory levels, the building samples indicated the following risk levels in housing units from lead poisoning:

low risk	73.75%
medium risk	25.72%
high risk	00.52%

³⁸ Staff Judge Advocate, Input for 1996 Annual Command History, May 8, 1997, pp. 6-7 and Enclosure 8.

³⁹ Secretary of Defense William J. Perry, "Annual Report to the President and the Congress, March 1996," Chapter 5, p.1, internet source: http://www.dtic.mil/execsec/adr96/chapt_5.html.

⁴⁰ Secretary of the Army Togo D. West, Jr. "The Army Meets Today's Challenges While It Prepares for the 21st Century," Army Greenbook 1996-1997, (October 1996), p. 16.

⁴¹ USAARMC and Fort Knox, "Salt River Country Strategic Plan," Draft, September 10, 1996, p. 14.

⁴² Directorate of Public Works, Input for Annual Command History, May 5, 1997, Enclosure G.

⁴³ Directorate of Public Works, Input for Annual Command History, May 5, 1997, Enclosure F.

⁴⁴ Mike Mooney, "Housing Executive of the Year," Inside the Turret, December 5, 1996, p. 3A.

Simultaneous with the survey, MEDDAC continued its policy of regularly testing children in the housing areas for signs of lead poisoning. These tests have found no childhood lead poisoning to date.⁴⁵

The Whole Neighborhood Renewal project represented the largest family housing program. In September 1996 Caddell Construction Company of Montgomery, Alabama, received a contract to build 140 modern three and four bedroom single family homes. The contract represented the successful end to five years' lobbying to demonstrate that the cost of maintaining old structures equalled the cost of new ones. The \$19.5 million contract included homes, utilities, sidewalks, tennis courts, and sports field. To provide the space for this construction, the Prichard Place housing unit with its nearly fifty year-old structures would be demolished. The entire project was to be completed by the spring of 1999.⁴⁶

Other quality of life construction included the creation of a gazebo for entertainment purposes and planning for a new guest house. The guest house is a non-appropriated fund project expected to be completed by December 1997. It will provide modern accommodations and permit easy access to the Anderson Complex. While enhancing the impression visitors receive of the post it should also provide a stimulus to NAF recreational activities and itself generate funds to support NAF activities across post.⁴⁷

Five barracks in the 1400 block underwent renovation. The new barracks provided a more comfortable living environment for single soldiers. They represented the outcome of studies of single soldier needs conducted at DA, TRADOC, and post level. For an estimated cost of \$28 million, the new barracks provide soldiers greater privacy and modern amenities. The barracks also represent an equalization in the living standards between married and single soldiers.⁴⁸ A follow-on plan included the building of a new barracks facility on Brave Rifles Road, but Congress had not appropriated the funds by year's end.⁴⁹

Fort Knox's Better Opportunities For Single Soldiers provided further support for the single soldier. Established at Fort Knox in 1991, the BOSS program is part of an Army-wide organization that tries to ensure a high quality of life for the single soldier. The post program provides activities based upon soldier recommendations. In the absence of suggestions the BOSS staff generates its own ideas. The organization has only one paid employee; the rest of the organization is volunteer-driven. Despite the fact that soldier suggestions lagged, the program received an award for the Best Event Sponsored by a Boss Program for its role in the Golden Field Day activities held annually in Radcliff.⁵⁰

Chaplain Steven Demien provided additional support for single soldiers in the 16 CAV. In August he sponsored and led a canoe trip down the Blue River from Milltown, Indiana. The event provided a break from regular military duties for the thirty-nine soldiers who participated. It also demonstrated the continued dedication of the Staff Chaplain's Office to the mental and physical well-being of all soldiers on post.⁵¹

Family support activities in 1996 reflected the importance attached by the Army to families. The Army Community Service Annual Training Seminar held in November adopted the theme "Partners in Readiness" to symbolize the impact of family needs upon soldier readiness. The seminar provided information on domestic concerns including parent-child relations, moving, gang awareness, health, and

⁴⁵ Phone conversation between USAARMC Historian Dr. Robert S. Cameron and DPW Environmental Management Division Chief Al Freeland, July 18, 1997; Briefing slides of EQCC meeting, August 21, 1996; Directorate of Public Works, Input for Annual Command History, May 5, 1997, Enclosure K.

⁴⁶ Directorate of Public Works, Input for Annual Command History, May 5, 1997, Enclosure E; SGT Tim Usrey, "Building begins on 140 new Prichard Place homes," Inside the Turret, December 19, 1996, pp. 1A, 19A.

⁴⁷ Directorate of Public Works, Input for Annual Command History, May 5, 1997, Enclosure E; SSG Eric D. Lobsinger, "Post continues to improve despite cuts," Inside the Turret, December 12, 1996, pp. 1A, 19A.

⁴⁸ Directorate of Public Works, Input for Annual Command History, May 5, 1997, Enclosure E; PFC Tami Reiman, "Remodeled barracks ready for May move-in," Inside the Turret, January 18, 1996, p. 1A; PFC Shirley R. Potter, "Weather delays barracks renovation," Inside the Turret, June 27, 1996, pp. 1A, 20A; PFC David M. Roberts, "16th Cav. moves into new barracks," Inside the Turret, October 24, 1996, p. 1A.

⁴⁹ PFC Shirley R. Potter, "Weather delays barracks renovation," Inside the Turret, June 27, 1996, pp. 1A, 20A.

⁵⁰ SGT Eric D. Lobsinger, "BOSS takes 2nd at conference," Inside the Turret, October 10, 1996, p. 6A.

⁵¹ Staff Chaplain, Input for 1996 Annual Command History, April 29, 1997.

finances. This information sought to help families overcome the "little" problems that can disrupt households and undermine a soldier's morale.⁵²

Activities supported by the Staff Chaplain's office reflected the traditional importance of the ministry upon family unity. Throughout the year the Staff Chaplain's office offered a variety of classes and training intended to promote familial and marriage bonds. The classes addressed the importance of open communication within the family and how to achieve it. They also addressed a range of issues in parent-child relations, offering constructive lessons through role-playing and demonstrations. Outdoor activities included a special family outing held at the Otter Creek Park intended to bring families closer together through participation in a series of physical activities. The Kentucky Association for Marriage and Family Therapy offered "marriage checkups" for the Fort Knox area. These sessions helped families identify potential trouble spots and strengthen marriage bonds.⁵³

General Maggart's interest in minimizing domestic violence underscored the importance of October's Spouse Appreciation Week. October was also National Spouse Abuse Prevention Month. The Army adopted the theme "Safe and Secure." Spouse Appreciation Week stressed the importance of maintaining a home environment that did not threaten the well-being and safety of family members. A cooperative effort by DCFA, MEDDAC, Laws Enforcement Command, the Fort Knox Community Schools, and the Staff Chaplain provided a series of special events that focused attention upon the importance of spouses and families. The involvement of multiple organizations underscored the importance of the week and helped wide dissemination of information regarding domestic violence and its potential impact upon children.⁵⁴ Other major information sharing events during the year included the Youth at Risk Seminar Camp, the Toy Drive, Golden Field Day, and the establishment of a Risk Reduction and Family Advocacy Program Committee. These events all sought to build and maintain a healthy and safe working and living environment.⁵⁵

The Army Family Team Building program supplemented these family-oriented services. The program educates and trains the families of RC, AC, and DA civilians in adapting to a military lifestyle and becoming self-sufficient. It is an organization of family members for military families. While Army families have always supported one another, AFTB represents an institutional awareness of the family's importance. With family needs secured and family members informed about the military environment, soldiers can better focus upon their mission, and Army readiness improves.

AFTB is an Army-wide volunteer program that emerged following the Gulf War. The difficulties some families faced when their military members deployed to Saudi Arabia for Operations Desert Shield and Storm indicated the need to train families how to be self-sufficient. The high OPTEMPO of the Army made this need continuous. AFTB planning began after the Gulf War at the DA level.⁵⁶ Army Chief of Staff General Gordon Sullivan and Sergeant Major of the Army Richard Kidd approved the program in 1993. It has received consistently strong support from the Army's senior leadership since then.⁵⁷ This command emphasis extended throughout the Army down to the unit level in recognition of the link between soldier morale and family situation.⁵⁸

The Vice Chief of Staff of the Army acts as the overall director of AFTB. The Community and Family Support Center and Civilian Personnel Policy Division of the Pentagon coordinate the respective family and civilian portions of the program. At the post level the garrison commander provides logistical and

⁵² COL Douglas M. Harris, ATZK-CFF-A (608-18), "Army Community Service Annual Training Seminar," memorandum, September 25, 1996, in DCFA memoranda folder.

⁵³ Staff Chaplain, Input for 1996 Annual Command History, April 29, 1997.

⁵⁴ Administrative Assistant M.E. Hammond, ATZK-CFF-A (608-18), "Spouse Appreciation Wee, 21-25 October 1996," memorandum, September 23, 1996, in DCFA memoranda folder.

⁵⁵ Julie Dvorak, "List of Accomplishments," 1996, in DCFA Trends and Activities folder.

⁵⁶ Dr. Robert S. Cameron, "Army Family Team Building Description and Trends," memorandum for record, July 18, 1997, pp. 1,3.

⁵⁷ AFTB, AFTB Overview, undated, viewgraph presentation, viewgraphs 21-22, in AFTB 1996 Annual Command History Input folder.

⁵⁸ Dr. Robert S. Cameron, "Army Family Team Building Description and Trends," memorandum for record, July 18, 1997, p. 2.

administrative support.⁵⁹ Family education is provided through a three-tiered system of classes. The first provides basic information to family members new to the military. The second builds leadership, communication, and crisis management skills for family members aspiring to community leadership roles, and the third targets experienced spouses and community leaders.⁶⁰ Graduates of all three levels of classes have the option of taking a comprehensive exam worth up to five college credits with some colleges. Volunteers instructors teach these classes. To ensure a common curriculum, CFSC established a standardized, centrally funded train the trainer program. Volunteers who completed this instruction agreed to support their local communities for one year, training new instructors.⁶¹

Fort Knox's AFTB program benefited from these actions and from the support given it by the post's senior leadership. Indeed, Mrs. Maggert had participated in the initial DA-level planning of the program. This support extended to the unit commanders and directors. The former made special efforts to ensure that all new soldiers became familiar with the program and used it. The program proved an unqualified success in its ability to attract students and volunteers, and in its ability to disseminate information to soldiers and families alike (see Figure 3.4). In 1994, AFTB acquired Building 707 and commenced instructor training. In 1995 it began conducting classes, and by 1996 required part-time staff position funded by the Garrison Command to coordinate its growing activities. The program also benefited from its link with the Kentucky Interservice Committee, a state organization that provides military family support throughout Kentucky. Through this link the Fort Knox program extended its services to include RC elements throughout the state.⁶²

AFTB's volunteers came from military families and resident civil service members. No shortage existed. The high turnover rate of military personnel and their families on post ensured a steady supply of interested people who recognized the potential value of the program. Moreover, as soldiers rotated to TRADOC installations for training, their spouses began to see this time as an opportunity for family training through AFTB classes.⁶³

Figure 3.4: AFTB Expansion of Activity⁶⁴

	1994	1995	1996	1997
Volunteer Hours	500	2263	8641	8320
Students		467	1887	1836
Personnel Briefed		0	1700	4840
Seminars		0	23	147
Conducted				
Open Classes Held		77	237	107

⁵⁹ AFTB, "Most Commonly Asked Questions About AFTB," pamphlet, undated, in AFTB 1996 Annual Command History Input folder.

⁶⁰ AFTB, AFTB Overview, undated, viewgraph presentation, viewgraphs 10-11, in AFTB 1996 Annual Command History Input folder.

⁶¹ AFTB, AFTB Overview, undated, viewgraph presentation, viewgraphs 18-20, in AFTB 1996 Annual Command History Input folder; AFTB, "Most Commonly Asked Questions About AFTB," pamphlet, undated, in AFTB 1996 Annual Command History Input folder.

⁶² Dr. Robert S. Cameron, "Army Family Team Building Description and Trends," memorandum for record, July 18, 1997, p. 1.

⁶³ Dr. Robert S. Cameron, "Army Family Team Building Description and Trends," memorandum for record, July 18, 1997, p. 2.

⁶⁴ AFTB, Input for the 1996 Annual Command History.

The success of the program, however, created a problem. The Army's enthusiastic support ensured that existing family members of the AC and RC rapidly attended AFTB classes wherever available. Most "new" personnel arriving at Fort Knox had already taken the classes available. The only consistent student group remained those family members new to the Army: primarily the spouses of AOBC attendees and new enlistees. Within two years of its start, the program had peaked. Ample opportunity exists, however, for the program to adapt to the changing needs of soldiers and their families.⁶⁵ AFTB's vitality, its minimal cost, and its trained instructors make it an ideal organization to provide information in whatever areas the Army wishes to stress.

The ACS Outreach Program supported military families living off-post. This program provided information and services to boost self-sufficiency in the off-post community. In particular the program targeted junior and new personnel and their families in the Radcliff, Muldraugh, and Vine Grove areas.⁶⁶ The program relied upon volunteers to act as liaisons with these families, ensuring that they had information/access to services provided to on-post families. The liaisons themselves were active duty military or family members, ensuring their familiarity with the military community and the special needs of new arrivals.⁶⁷

The Family Force Forum permitted the Fort Knox community to voice concerns directly to the senior leadership. This link underscored the leadership's commitment to families and provided leaders with community feedback about the impact of their actions. Typical areas of concern addressed during the forums included consumer services, support given to RC families, housing, entitlement, medical services, and youth education/activities. Specific items expressed that could not be addressed at the post level were forwarded to TRADOC HQ.⁶⁸

Growing concerns about teen violence and drug usage prompted efforts to provide constructive activities for youths. To prevent the rise in teen-violence found in many communities across the country, the post undertook several programs to expose teens to new ideas and focus their energies upon self-improvement. For example in March the Teen Program Branch of DCFA offered a series of classes to build self-esteem. Low self-esteem appeared to be linked to drug and alcohol abuse and a host of teen-related problems. Similar classes held in 1995 had generated praise from the students who attended.⁶⁹ Power Praise IV encouraged Christian beliefs among teens. Organized by Teen Builders, a Hardin County youth organization, the event provided contemporary interdenominational worship services to teens. It particularly aimed at broadening the appeal of Christianity among youths.⁷⁰

The closure of the Crittenberger Elementary School reflected the impact of budget cuts in the DOD School System. Fewer dollars were available for those schools on Fort Knox at a time when student enrollment declined. After reviewing their current and projected budgets, enrollment trends, and facilities, the Fort Knox Community Schools opted to close the Crittenberger School. Students and staff transferred to Walker School, a more modern facility with recent additions.⁷¹

Fort Knox planned to build and operate a Recycle Center in the City of Radcliff. The leadership prepared a Joint Venture Agreement and presented it to the City Council. The latter rejected the entire proposal when it became clear that Radcliff would share in the start-up costs. The City Council refused to

⁶⁵ Dr. Robert S. Cameron, "Army Family Team Building Description and Trends," memorandum for record, July 18, 1997, p. 3.

⁶⁶ Isadora Ewing, "Outreach Program is 'Army's secret weapon'," Inside the Turret, June 13, 1996, p. 11A.

⁶⁷ ACS Outreach Newsletter, August/September 1996, p. 1.

⁶⁸ COL Douglas M. Harris, ATZK-CFF (608), "Fort Knox Family Force Forum," memorandum, March 27, 1996 in DCFA Family Support Division Memoranda; SPC Bill Boldt, "Support division tackles issues raised in Family Force Forum," Inside the Turret, February 22, 1996, pp. 1A, 16A.

⁶⁹ DCFA, "Program hopes to boost post teens' self-esteem," Inside the Turret, January 18, 1996, p. 2A.

⁷⁰ Staff Chaplain, Input for 1996 Annual Command History, April 29, 1997.

⁷¹ Fort Knox Community Schools, "Education director address local issues," Inside the Turret, June 27, 1996, p. 2A; Fort Knox Community Schools, "Crittenberger closes, moves to Walker," Inside the Turret, July 3, 1996, p. 2A.

obligate Radcliff tax revenues to the Center. It did, however, offer to cooperate in any manner that did not require the City's financial support. The Recycle Center project collapsed.⁷²

New MWR facilities, however, continued to evolve. Construction of the Rose Terrace Water Park and a covered pool began during the year with NAF funding. DCFA—DBO following its creation—monitored the construction effort and anticipated the park's opening in 1997. The post could also look forward to an additional facility, following the DA MWR Board of Directors' approval of plans to build a sports complex for an estimated \$5 million. The existing post facilities further benefited from the emergence of strategic plans for the club system and the golf course. TRADOC's emphasis upon making such activities financially self-sufficient inspired these plans.⁷³

The success of the Fort Knox Army Career and Alumni Program (ACAP) efforts in 1996 resulted in its consideration as one of the top programs in CONUS. It provided regional support throughout a seven state area, and conducted twenty-two workshops for some 500 clients. The success and growth of the services rendered by ACAP led to the creation of an ACAP database to keep track of the services and clients.⁷⁴ ACAP activities also included the annual job fairs held in March and September. These events matched employers in the public and private sectors ready to interview on the spot with potential employees. Each event included the participation of about ninety companies with background and hiring information. Both job fairs were considered successful with over 900 people in attendance at each one. The bulk of these attendees had some affiliation with the military and most came from Hardin or Meade Counties. However, significant numbers of job-seekers came from other parts of Kentucky or other states, reflecting high reputation that Fort Knox's job fairs have attained in the last few years.⁷⁵

Human Resource Issues

Downsizing within DoD continued throughout 1996 with direct impacts upon the DA civilian population. Reduced budgets further fueled this trend, eroding the ability of installations to maintain their work forces. In November commanders and directors were notified that 250 civilian positions had to be eliminated to meet budget shortfalls in Fiscal Years 1997 and 1998. To meet this objective, the post adopted a familiar strategy: implementation of the Pre-RIF Initiatives for Management and Employees (PRIME) program, opening a special Voluntary Separation Incentive (VSI) window in November, and offering Voluntary Early Retirement Authority (VERA). By the year's end this strategy had reduced the number of excess Armor Center employees to less than 100, although the placement options under VSI, PRIME, and Expanded VSI had not been finished. In pursuing this strategy, the post leadership sought to downsize without involuntarily separating employees. Its success, however, depended upon the continued cooperation and flexibility of employees, managers, and the union. These efforts, however, could not prevent a projected reduction in force (RIF) for September 1997.⁷⁶

In anticipation of future downsizing, employees received a continuous stream of information about the early retirement opportunities and the process for taking a voluntary separation. Interest in these incentives remained high among a work force whose average age remained between 45 and 60.⁷⁷ Before

⁷² Julie Dvorak, "List of Accomplishments," 1996, in DCFA Trends and Activities Folder.

⁷³ Julie Dvorak, "List of Accomplishments," 1996, in DCFA Trends and Activities Folder. J. Dvorak, list of accomplishments. For additional background on the club system see Dr. James W. Williams, "US Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, pp. 5-21 through 5-22.

⁷⁴ Julie Dvorak, "List of Accomplishments," 1996, in DCFA Trends and Activities Folder.

⁷⁵ Directorate of Human Resources, Input for 1996 Annual Command History, Job Fair After Action Reports, March 25, 1996 and September 25, 1996.

⁷⁶ Directorate of Human Resources, Input for 1996 Annual Command History, "Downsizing of Civilian Work Force," undated; Civilian Personnel Office, "Civilian Reductions," Civilian Personnel Newsletter, CP10-96, October 1996, pp. 1-2; Civilian Personnel Office, Civilian Personnel Newsletter, CP11-96, November 1996, pp. 1-6.

⁷⁷ Directorate of Human Resources, "Age Distribution: Armor Center Civilian Work Force (FTP)," slide, 1997, in DHR Age Distribution folder.

the summer VSI window had been determined upon, inquiries flooded the Civilian Personnel Office. Of the 115 applications submitted, 40 had been accepted. 34 of these applications came from employees holding positions not declared excess and whose positions could not be used to place someone else. The closure of the Naval Ordnance Station in Louisville also resulted in efforts to match people there marked for RIF with Fort Knox employees seeking VSI. Despite over 100 potential matches, however, only two individuals from the Ordnance Station replaced Fort Knox employees, with the Navy paying the VSI costs.⁷⁸

Voluntary RIF also became viable following changes in DOD legislation. In a voluntary RIF, employees too senior to receive a RIF notice can volunteer to become part of one. Typically employees already want to leave federal service but desire severance pay or continued health benefits. Although no RIFs occurred at Fort Knox in 1996, this program would help to reduce the human impact if one occurred as scheduled in 1997. Fewer people would lose their jobs against their will.⁷⁹

Sustaining work force morale amid downsizing and reengineering efforts proved a difficult task. Both trends created uncertainty about future prospects. The high average age of the Fort Knox work force increased the personal impact of this such uncertainty.⁸⁰ Veteran workers faced the prospect of holding positions determined to be excess. This status undermined their sense of security and their future plans. Even when these people were placed in other positions, they often suffered a job downgrade and faced an alien and potentially undesirable work setting.

The Fort Knox Labor and Management Partnership conducted a random survey of 200 employees to identify areas of concern. The responses reflected the impact of downsizing and the prospect of a RIF. Communication proved a major concern. Many employees felt they had little influence upon the decision-making process that shaped their work environment. In all categories of questions, the responses proved more negative than in past years. These results indicated that Partnership efforts to inform employees of major post actions through periodic luncheons and the Civilian Personnel Newsletter and General Maggert's emphasis upon open communication did not dispel people's lingering fears.⁸¹

The turbulence created by downsizing and reengineering built a downward spiral in morale. In addition to loss of positions, those people holding jobs not declared excess still faced the possibility of losing their position to more senior personnel whose positions had been abolished. This ripple effect threatened to disrupt the work place and spread fears of job loss far beyond those people whose positions were eliminated. Survivors of downsizing often suffered the disruption of their peer support system when friends and coworkers suffered job loss and/or relocation.⁸²

Regionalization of the CPO also impacted the work force. By October 1, 1997 the post must have completed the downsizing of the CPO into a Civilian Personnel Advisory Center. The staff must be reduced from 53 to 18. In 1996 placements in other organizations, retirements, resignations, and personnel transfers to the new regional office accounted for 22 of these positions. Regionalization, however, also replaces personalized handling of personnel files and actions with automated procedures at a remote office. Managers will assume greater responsibilities for some personnel matters, relying upon CPAC for guidance. The CPAC will continue to process new employees, advise on benefits, and provide advisory services for labor-management employee relations, but the broad range of personalized services previously available will disappear.⁸³

⁷⁸ Civilian Personnel Office, "Voluntary Separation Incentive," Civilian Personnel Newsletter, CP 7-96, July/August 1996, p. 1.

⁷⁹ Civilian Personnel Office, "Voluntary RIF," Civilian Personnel Newsletter, CP 6-96, June 1996, p. 3.

⁸⁰ Directorate of Human Resources, "Age Distribution: Armor Center Civilian Work Force (FTP)," slide, 1997, in DHR Age Distribution folder.

⁸¹ Directorate of Human Resources, Input for 1996 Annual Command History, Fort Knox Labor and Management Partnership, undated.

⁸² Dr. Robert S. Cameron, "EEO Trends and Issues in 1996," memorandum for record, July 9, 1997, p. 4.

⁸³ Directorate of Human Resources, 1996 Annual Command History Input, "Civilian Personnel Office Regionalization," undated; Directorate of Human Resources, 1996 Annual Command History Input, "Civilian Personnel Regionalization South Central Region," Proposal, September 22, 1995; Civilian Personnel Office, "CPO Regionalization," Civilian Personnel Newsletter, CP12-95, October 1995, pp. 1-2;

By December evidence of low morale became more visible. That month's CPO newsletter included an article stressing the importance of suicide prevention. It referenced increased incidents of suicidal behavior on post, reminding readers that work-related problems were among the leading causes of suicide. The article also noted the increased frequency at which the Suicide Prevention Task Force convened. This task force comprised senior civilian and military leaders.⁸⁴

In November DA notified Congress of their intent to conduct Commercial Activities studies of the Directorate of Public Works and Logistics at several installations, including Fort Knox. These studies determine an organization's most efficient structure and lowest operating cost and compare it with bids for the same functions from private contractors. Although part of the Army's effort to realize cost savings, the pending study reduced the morale of DPW and DOL employees already stung by downsizing. The multi-year span of the study only increases the morale impact. Director of Logistics Nancy Gilmore especially objected to the study, since DOL planned a major reorganization intended to improve its efficiency.⁸⁵

Morale-raising efforts occurred throughout the year with General Maggart's full support. His emphasis upon open communications promoted a sense of common cause throughout the work force. Social events like DOL's work force celebration picnic provided a means for people to interact and temporarily escape problems in the work place.⁸⁶ The erection of the Civilian Monument on August 28 also underscored the importance attached to the civilian work force. The monument represented the culmination of an 18-month fund-raising effort led by the Fort Knox Leadership Association. The monument's inspiration was prompted by the October 1993 shooting spree of a disgruntled employee who killed several coworkers before taking his own life. Donations from local businesses and communities provided over \$25,000 to build the monument.⁸⁷

Some additional opportunities opened through implementation of a revised merit promotion plan. The Fort Knox Labor and Management Partnership developed new promotion policies after two years of study by a special committee representing a cross section of the work force. The program was developed with four objectives: improve customer service, simplify the process, make stakeholders accountable, and increase the perception of fairness across the installations. The Partnership considered the revised program a success.⁸⁸

The Mentoring Program offered by the EEO office helped people prepare for change. The one-year program linked an employee interested in a job transfer with a senior person in the desired field. The latter acted as a mentor, providing advice and information about how to make the transition. The mentor also assisted in creating a network of useful contacts. At one-hour weekly meetings, the mentor discussed the employee's progress and addressed questions. The employee could abandon the program any time. Although not the original intent, this program by default offered some degree of retraining at no cost. In 1996 sixteen employees graduated from the program. Its success attracted TRADOC interest and raised the possibility of the program becoming a model for other posts.⁸⁹

Changes affecting the civilian work force found expression in the complaint trends tracked by the EEO Office. A noticeable rise in the number of complaints filed occurred in 1996. This rise stemmed from

Civilian Personnel Office, "CPO Regionalization," Civilian Personnel Newsletter, CP3-96, March 1996, pp. 1-2.

⁸⁴ Civilian Personnel Office, "Suicide Prevention," Civilian Personnel Newsletter, CP12-96, December 1996, pp. 9-10.

⁸⁵ Dr. Robert S. Cameron, "DOL Trends in 1996-1997," memorandum for record, July 9, 1997, pp. 2-3; Civilian Personnel Office, "DPW/DOL Commercial Study," Civilian Personnel Newsletter, CP12-96, December 1996, p. 2.

⁸⁶ SPC Rhonda Marie Jones, "DOL planning work force celebration for employees," Inside the Turret, June 27, 1996, pp. 1A, 15A.

⁸⁷ Civilian Personnel Office, "Civilian Monument," Civilian Personnel Newsletter, CP8-96, September 1996, p. 1.

⁸⁸ Directorate of Human Resources, Input for 1996 Annual Command History, Fort Knox Labor and Management Partnership, undated.

⁸⁹ Dr. Robert S. Cameron, "EEO Trends and Issues in 1996," memorandum for record, July 9, 1997, p. 2; Equal Employment Opportunity Office, Input for 1996 Annual Command History, 1996.

multiple causes, including growing uncertainty about job status, the downsizing of the work force, and the seemingly continuous post reorganization. The Civil Rights Act of 1991 also provided a financial incentive to follow complaints of job discrimination with a law suit. For the first time the Act permitted a complainant to seek compensatory damages up to a maximum of \$300,000 based upon how bad the individual felt about the situation that generated the complaint. The clearest trends included white males filing complaints of sexual discrimination, white employees filing for racial discrimination, sexual discrimination complaints, and complaints based upon physical and mental disability. Some of the increase in complaints among civilian workers stemmed from the increasing workload that downsizing generated. The resultant stress and frustration raised the sensitivity levels of workers. Simultaneously, signs of apathy on the part of people holding positions due to be abolished became more frequent.⁹⁰

Within the Armor Center, the largest source of complaints proved to be the newly created DBO. The personnel shuffling that accompanied the new organization's creation and efforts to revive the post's dying club system partially account for this high incidence rate. The hiring of new managers and implementing new business practices could only be afforded by eliminating existing jobs. Complaints followed.⁹¹

The rise in complaints also reflected the expanded geographic area supported by Fort Knox's EEO office. The office provided EEO support to eleven states. It assumed responsibility for processing Fort Benjamin Harrison's complaints following that post's closure. In addition, Fort Knox EEO personnel supported the Defense Finance and Accounting Service, processed occasional USAREC cases, and handled complaints against the command groups of other posts.⁹²

In providing adequate service throughout this area the EEO office faced a growing imbalance between its case load and personnel. The permanent staff is expected to shrink from five to four by October 1997.⁹³ Volunteer counsellors supplemented this staff by explaining the process required to everyone who files a complaint. Counsellors, however, received few benefits and little recognition, but their work load continually rose. The attrition rate among counsellors increased and replacements became more difficult to attract.⁹⁴

As a remedy the positions of EEO counselor and Labor Management Partnership Council factfinder were merged. This merger benefited the EEO office. Factfinders normally investigate the background of serious complaints against management actions and help protect employees from arbitrary actions. Their association with the Labor and Management Partnership gave them a prestige unknown to the EEO counsellor. While the factfinders required some training in EEO issues, EEO counsellors found the typical cases investigated by the factfinder a welcome change. However, whether factfinder or EEO counsellor, the waiting period between a case opening and assignment of a factfinder/counsellor continued to rise from a couple of days to over a week.⁹⁵

The EEO staff also lost its most experienced member when Donna Stilwell retired on 30 September 1996. With 28-years' experience in EEO affairs, she possessed a wealth of personal expertise that could not be easily replaced. Marion McAleer became the new EEO officer. She lacked the EEO experience of her predecessor, but her CPO background brought a new perspective to the position. The EEO office benefited from a broader context in which to review EEO issues. The new EEO officer also brought a computer familiarity vital to marketing EEO concerns and the activities/needs of the EEO office. Her relocation from CPO to EEO typified a TRADOC-wide trend that followed the regionalization of the Civilian

⁹⁰ Dr. Robert S. Cameron, "EEO Trends and Issues in 1996," memorandum for record, July 9, 1997, p. 5; Equal Employment Opportunity Office, Input for 1996 Annual Command History, 1996.

⁹¹ Dr. Robert S. Cameron, "EEO Trends and Issues in 1996," memorandum for record, July 9, 1997, pp. 4-6; Equal Employment Opportunity Office, Input for 1996 Annual Command History, 1996.

⁹² Dr. Robert S. Cameron, "EEO Trends and Issues in 1996," memorandum for record, July 9, 1997, pp. 3-4; EEO, "Serviced Area," briefing slide in briefing entitled "Equal Employment Opportunity," undated, in EEO Background folder.

⁹³ EEO, "EEO Organization," briefing slide in briefing entitled "Equal Employment Opportunity," undated, in EEO Background folder; Equal Employment Opportunity Office, Input for 1996 Annual Command History, 1996.

⁹⁴ Dr. Robert S. Cameron, "EEO Trends and Issues in 1996," memorandum for record, July 9, 1997, p. 3.

⁹⁵ Dr. Robert S. Cameron, "EEO Trends and Issues in 1996," memorandum for record, July 9, 1997, p. 3.

Personnel Offices. In general, EEO offices benefited from this migration, but existing career development plans and promotion goals for EEO personnel had to be changed to accommodate the incoming people.⁹⁶

Affirmative employment programs had mixed successes in 1996. For African-Americans and women, downsizing obstructed efforts to secure senior administrative positions at the GS-11 through GS-15 levels. Minorities in general held no GS-14 or GS-15 positions. Women and African-Americans who did manage to reach GS-11 or higher found themselves poorly protected against either position cuts or being bumped by more senior personnel. A similar trend affected the affirmative employment programs for the lower pay levels.⁹⁷

In November the first revelations of what would become an Army-wide sexual harassment scandal began to appear in public. The scandal came as an unpleasant surprise to the Army, whose leaders had stressed the success of prevention of sexual harassment programs.⁹⁸ At first associated only with Aberdeen Proving Grounds, Maryland, allegations of sexual misconduct began to appear elsewhere. In 1997 the growing scandal claimed the careers of several general officers and senior enlisted personnel. It also jeopardized the Army's gender-integrated training and influenced the appointment of the Chairman of the Joint Chiefs of Staff.

Fort Knox, however, remained free from the scandal's taint. No significant sexual harassment trends emerged on post. Isolated, individual acts continued to occur, but no indications of systematic abuse of authority for sexual favors existed. The low incident rate resulted from the continuous emphasis placed upon defining sexual harassment and training its prevention. All civilians and military supervisors in charge of civilians had to attend Prevention of Sexual Harassment classes. These classes were not new, and had been required by TRADOC for several years. Military personnel received their own related training administered through the chain of command.⁹⁹ The EO office, however, reported only seven formal complaints in 1996: three racial and four sexual harassment. This low number reflected the vigor with which it pursued EO training among soldiers and the support given the program by the EEO office, the post directorates and commands, and the Partners in Excellence.¹⁰⁰

In December 1996 the Army tasked all installations to prepare bimonthly reports of allegations of sexual harassment by a military member. Fort Knox experienced two allegations of rape in a related incident, one of sexual harassment, and one of indecent assault. In all four cases the soldiers responsible were punished according to military law and regulations, resulting in two discharges and two reductions in rank with temporary pay forfeiture.¹⁰¹

Law and Order

Quality of life depended in part upon a secure community. Indeed, General Maggart's vision presumed that people would not fear crime and violence on Fort Knox. Building this security, however, required cooperation with the surrounding communities to ensure the safety of personnel on or off post.

Hardin County judges historically viewed Fort Knox as outside their jurisdiction when issuing domestic violence Emergency Protective Orders. They refused to issue such orders for victims on Fort Knox. The

⁹⁶ Dr. Robert S. Cameron, "EEO Trends and Issues in 1996," memorandum for record, July 9, 1997, p. 1.

⁹⁷ Affirmative Employment Program for Minorities and Women, "Annual Affirmative Employment Program Accomplishment Report: Summary Analysis of Work Force for FY 96," undated; EEO, "EEO Issues and Concerns," briefing slide in briefing entitled "Equal Employment Opportunity," undated, in EEO Background folder; Equal Employment Opportunity Office, Input for 1996 Annual Command History, 1996.

⁹⁸ "Sexual Harassment Declining, but Still Relevant," Defense 96 (Issue 4), pp. 34-37; Army News Service, "Sexual harassment declining, but still serious," Inside the Turret, July 18, 1996, p. 15A; Linda D.

Kozaryn, "Sexual harassment declining, but still major concern," Inside the Turret, July 25, 1996, p. 14A.

⁹⁹ Dr. Robert S. Cameron, "EEO Trends and Issues in 1996," memorandum for record, July 9, 1997, p. 5; Equal Employment Opportunity Office, Input for 1996 Annual Command History, 1996.

¹⁰⁰ Equal Employment Opportunity Office, Input for 1996 Annual Command History, 1996.

¹⁰¹ Staff Judge Advocate, Input for 1996 Annual Command History, May 8, 1997, Criminal Law Division, p. 1.

Office of the Staff Judge Advocate had sought to change this understanding without success. In August 1996 the Staff Judge Advocate discussed the issue with State Attorney General Ben Chandler. He supported the need to protect battered spouses on and off post. Further support from the US Attorney for the Western District of Kentucky, the Chief Justice of the Kentucky Supreme Court, and the governor resulted in a directive to local judges to issue protective orders for Fort Knox victims. The SJA office then proposed retrocession of such jurisdiction. The proposal was forwarded to the Secretary of the Army for approval, but so far no action has resulted.¹⁰²

Construction on Highway 313, connecting Route 31W and Interstate 65, finished during the late summer. Fort Knox and Hardin County, however, continued to disagree over a proposed rezoning of the adjacent land. Property owners in Hardin County wanted to change the zoning laws to permit a greater density of housing. Fort Knox opposed this action. Large scale development would generate a wave of noise complaints from future residents that would restrict post training operations. Of particular concern was the impact of large numbers of residents living in close proximity to several modernized and new tank firing ranges. The SJA office represented the post in its opposition to rezoning. This opposition encouraged the Hardin County Planning Commission and the Fiscal Court to vote against rezoning. However, additional proposals for rezoning quickly emerged and became the source of a new round of unresolved debates.¹⁰³

In recovering claims Fort Knox fared better. The Fort Knox Claims Office assisted 2,937 customers and processed 1,903 claims in 1996. These activities included recovery of \$715,000 from insurance companies for medical expenses. Ireland Army Community Hospital and other Army medical treatment centers received more than \$321,000 of this money. A further \$208,000 was recovered from household goods carriers who damaged property belonging to military personnel while relocating them. Moreover, the Commander of the U.S. Army Claims Service recognized the Fort Knox Claims Office as the best in Army.¹⁰⁴ Its success also led to greater responsibility. It assumed responsibility for the area previously serviced by the TACOM Legal Office in May, and it agreed to handle claims actions resulting from the withdrawal of U.S. forces from the Panama Canal in 1999.¹⁰⁵

Post safety benefited from the installation of an enhanced 911 emergency dialing system. This project reflected the stated needs of the post community and coincided with the introduction of a similar system in Hardin County.¹⁰⁶ The new system began operations on October 3, 1996 after two years of development and a cost of \$60,000. The new system linked Fort Knox with emergency organizations in the surrounding communities. It also provided access to a database that permits emergency personnel to pinpoint the phone's location and the best route to it regardless of caller input.¹⁰⁷

Fort Knox also cooperated with state and local law enforcement agencies. The post provided utilities and office space for the Greater Hardin County Narcotics Task Force. This task force included law enforcement personnel in Hardin County, the sheriff's department, and the Kentucky State Police. It targeted drug trafficking in the area.¹⁰⁸ Fort Knox Game Wardens in coordination with the Sheriff's departments of Meade, Hardin, and Bullitt Counties, the Kentucky Department of Fish and Wildlife, and the Kentucky State Patrol also undertook to eliminate marijuana on the post. During August

¹⁰² Staff Judge Advocate, Input for 1996 Annual Command History, May 8, 1997, Administrative Law Division, p. 5.

¹⁰³ Staff Judge Advocate, Input for 1996 Annual Command History, May 8, 1997, Administrative Law Division, p. 4.

¹⁰⁴ Staff Judge Advocate, Input for 1996 Annual Command History, May 8, 1997, Claims Division, pp. 3-4; Notes of Coordination Meeting, June 25, 1996.

¹⁰⁵ Staff Judge Advocate, Input for 1996 Annual Command History, May 8, 1997, Claims Division, p. 4.

¹⁰⁶ Dr. James W. Williams, "US Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, p. 5-14.

¹⁰⁷ SGT Tim Usrey, "911 system ready for operation," Inside the Turret, October 3, 1996, pp. 1A, 16A.

¹⁰⁸ PFC Tami Reiman, "Knox provides help in area war on drugs," Inside the Turret, February 15, 1996, pp. 1A, 17A.

and September \$175,000-worth of it was destroyed on Fort Knox.¹⁰⁹ To further promote cooperation among Fort Knox and surrounding communities LEC hosted a series of events that provided entertainment and education in crime prevention. Events like a bike rodeo and Law Enforcement Career Day, held at Elizabethtown Community College, promoted public awareness of crime prevention and built community support for law enforcement on and off post.¹¹⁰

In May MP Game Wardens conducted a series of successful undercover operations that apprehended people illegally fishing on Fort Knox's lakes. They also disrupted illegal activities on Yano Multi-Purpose Range Complex, using the range's thermal tracking system to locate the people involved.¹¹¹ LEC's Crime Prevention Division conducted the first robbery training course at the Post Exchange in May.¹¹²

These actions reduced criminal activity to a low level, but could not altogether eliminate it from the post. Among soldiers, Figure 3.5 illustrates punitive actions taken for criminal or improper conduct. Of particular concern to the entire post was a rash of computer thefts that began in July 1995 and continued into 1996. These thefts resulted in the loss of \$67,000 worth of equipment to a post increasingly reliant upon computers for routine communication and data processing. In fact the thieves broke into older buildings, dismantled personal computers, and removed the most modern central processing units and memory chips.¹¹³

Figure 3.5: Punitive Actions Against Soldiers¹¹⁴

Nature of Action	Numbers of Soldiers Involved
Courts Martial	13
Administrative Discharge Boards	12
Magistrate Court Misdemeanor Cases	77
Felony Prosecutions	11
Summary Courts Martial	3
Nonjudicial Punishment Actions	1133
Administrative Discharge Request in Lieu of Courts Martial	1072

Car break-ins also rose in 1996. Between August and October thieves broke into 62 vehicles on post, compared with 29 the previous year. In most cases, only loose items were stolen. Despite prior warnings from the military police, only 28 of the 62 vehicles were locked. In September, random patrolling by MPs discovered over 100 vehicles unlocked in a single housing area.¹¹⁵ LEC's MPI Section investigated 53 break-ins and apprehended three people involved in multiple incidents.¹¹⁶

The Regional Corrections Facility on Fort Knox detains personnel from all branches of the Armed Forces while awaiting trial or completing a maximum sentence of five years. The facility also tries to rehabilitate inmates for return to duty or release. During 1996 the monthly average prisoner population

¹⁰⁹ Headquarters and Law Enforcement Command, Input for 1996 Annual Command History, Historical Data for PMO Sections--Game Warden Section.

¹¹⁰ Headquarters and Law Enforcement Command, Input for 1996 Annual Command History, Historical Data for PMO Sections--Crime Prevention.

¹¹¹ Headquarters and Law Enforcement Command, Input for 1996 Annual Command History, Historical Data for PMO Sections--Game Warden Section.

¹¹² Headquarters and Law Enforcement Command, Input for 1996 Annual Command History, Historical Data for PMO Sections--Crime Prevention.

¹¹³ SPC Rhonda Marie Jones, "CID investigates post computer larcenies," Inside the Turret, June 20, 1996, pp. 1A, 19A.

¹¹⁴ prepare in simple bar graph; source SJA input rept--pp1-2

¹¹⁵ SGT Tim Usrey, "POV break-ins increase on post," Inside the Turret, October 10, 1996, p. 1A

¹¹⁶ Headquarters and Law Enforcement Command, Input for 1996 Annual Command History, MPI History.

was 117 with an average sentence of 25 months.¹¹⁷ An additional 118 inmates transferred to the Fort Knox facility following the closure of the Regional Corrections Facility at Fort Dix.¹¹⁸ Sixteen inmates were released on parole, but none were restored to military duty. Pepper spray also became available for use upon uncooperative inmates. Conversely, several new programs were added to an already broad range of inmate education and training. A Drug/Alcohol Treatment Program was introduced to help inmates break addictive habits. A Multiphasic Self Development program further helped inmates manage anger and stress and establish realistic goals for themselves. The program combined individual and group therapy techniques to provide acceptable alternatives to violence in problem solving. Interested inmates continued to receive vocational training, working as apprentices for DPW and DOL, and generated a total savings to those organizations of \$1,250,185.08.¹¹⁹

Protecting the Environment

Sustaining a high quality of life for the post included environmental preservation. At Fort Knox DPW translated the environmental policies of the Secretary of Defense into daily reality. It did so despite the overlapping environmental laws of three adjacent counties, the state government, and the federal government. Improvements in the environmental arena continued the progress begun in 1994 and 1995.

DPW completed a Pollution Prevention Plan in 1996 to replace current materials, processes, or practices that used hazardous and nonhazardous materials, energy, water, or other resources. The plan seeks to conserve natural resources and prevent harmful substances from entering the environment. Impetus for this plan came from the Pollution Prevention Act of 1990 that designated pollution prevention as a "natural objective" and DOD's development of a pollution strategy.¹²⁰

The Hazardous Materials Center incorporated the best features of hazardous materials programs of other DOD installations. Operated by DOL and supported by DPW, it became the central receiving point for hazardous materials entering Fort Knox, allowing better control of the use and storage of such materials. The HAZMAT Center also tracked material acquisition and use for environmental compliance. Excess but usable hazardous materials could also be turned in to the center, where they would be repackaged and distributed as "free issue" to post customers. This process reduced the need for large inventories of hazardous materials and increased the HAZMAT Center's ability to track these materials. A cost-savings was expected from the facility's operations.¹²¹

In 1996 DPW introduced new regulations to govern wastewater pretreatment that sought to prevent violation of the Clean Water Act. Of particular concern was preventing the introduction of pollutants into the Wastewater Treatment Plant that could interfere with its operation or lower the water quality to unacceptable standards. The policy also called for vigorous monitoring of pollutant discharges to prevent their flowing into the post sewer system.¹²² This water flowed to the new Waste Water Treatment Plant that opened in 1995 and cost \$15 million. The plant removed the contaminants and sends the water to Mill Creek.¹²³

¹¹⁷ Headquarters and Law Enforcement Command, Input for 1996 Annual Command History, "TRADOC Annual Historical Report (Jan 96 - Dec 96)," January 29, 1997.

¹¹⁸ Staff Judge Advocate, Input for 1996 Annual Command History, May 8, 1997, Criminal Law Division, p. 2.

¹¹⁹ Headquarters and Law Enforcement Command, Input for 1996 Annual Command History, "TRADOC Annual Historical Report (Jan 96 - Dec 96)," January 29, 1997.

¹²⁰ Directorate of Public Works, Input for 1996 Annual Command History, May 5, 1997, Enclosure L.

¹²¹ MG Lon E. Maggart, ATZK-DLS-H (200), "Hazardous Materials Control," October 28, 1996; Briefing slides of EQCC Meeting, August 21, 1996; Notes of EQCC Meeting, November 20, 1996.

¹²² USAARMC Headquarters, Regulation 200-1, "Wastewater Pretreatment Program," November 26, 1996, in DPW Memoranda folder.

¹²³ SPC Rhonda Marie Jones, "DPW informs public about waste water issues," Inside the Turret, August 15, 1996, pp. 1A, 19A.

The new policy followed the discovery of silver in the water that exceeded permit limits. The post was susceptible to receiving a fine of \$25,000 per day until the silver levels fell to an acceptable level. The EQCC meeting of November 20 stressed the importance of adhering to the new regulations and monitoring all metal emissions into the water, warning participants that operations could be stopped if metal contamination became a recurring problem. Most metal emissions, however, remained well within regulatory limits and had decreased over the last three years, particularly lead, mercury, and cadmium.¹²⁴

In 1992 Fort Knox implemented the Integrated Training Area Management Program. Under this program the post undertook the rehabilitation of land damaged by training activities to control soil erosion and maintain a sustainable and safe training environment. Since then 1500 acres have been returned to their original state and revegetated to encourage the growth of fish and wildlife populations. The ITAM Program in general seeks to minimize the environmental impact of training activities and receives consistent support from the post leadership. Related efforts included construction of hardened crossing sites for armored vehicles, repairing road banks, and planting new trees. In coordination with the United States Department of Agriculture Natural Resources Conservation Service, new strands of vegetation and trees were planted at selected sites to improve their resistance to military training activities.¹²⁵

The coordinated effort of G3/DPTM and DPW resulted in the Resource Inventory and Conservation Plan. This plan provides an ecosystem-based strategic plan for rehabilitation and maintenance of the installation's training lands. It provides recommendations for resource protection measures for an active and dynamic military training site. The primary focus of this plan is to provide guidance in implementing conservation practices to correct soil erosion problems and to address surface and ground water management concerns. The plan derived from the United States Department of Agriculture Natural Resources Conservation Service under the guidelines established in that organization's June 1991 Memorandum of Understanding with the U.S. Army Armor Center.¹²⁶

The Fish and Wildlife Section of the Directorate of Public Works developed a mitigation plan for 21 acres that were previously drained wetland that exhibited a preponderance of upland vegetation. The vegetation was removed and hydrology restored. The area was then planted in wetland tree species. The wetland must be monitored for hydrology and vegetation for 5 years following establishment and must meet the criteria of a seasonally flooded forested wetland at that time. This criteria specifies the duration of saturation of the soil, the characteristics of the soil, and the species and number of trees that must be present. The monitoring period will end in 2000. The ultimate goal of the Fish and Wildlife Section is to develop a highly diverse forested ecosystem.¹²⁷

Fort Knox continued to work with the Commonwealth of Kentucky to reduce air pollution. The post was required to submit a Title V Air Emissions Permit by December 14, 1996. The permit will be issued by the state government by December 2000, with interim approval to be granted in the years preceding. The state determined that Fort Knox would be permitted as a single entity rather than as a collection of separation operations. The permit covers all 109,000 acres of the post and is the largest air permit granted in the state. The permit addresses all emissions from boilers/water heaters, furnaces, paint booths, degreasers, and internal combustion engines. Quarterly reports must be provided to the state on the source of emissions, and the post will be assessed a fee based upon the emission quantity.¹²⁸

With General Maggart's support DPW increased its demolition of old buildings on post. The large numbers of wooden buildings dating to World War II constituted a significant expenditure of funds to maintain them. In the absence of this funding some buildings became safety hazards, ready to collapse. Destroying these structures followed TRADOC instructions and generated additional space that could be

¹²⁴ Notes of EQCC Meeting, November 20, 1996.

¹²⁵ DPW Environmental Specialist Gail Pollock, "Erosion has effect on water quality," Inside the Turret, August 22, 1996, p. 13A.

¹²⁶ Directorate of Public Works, Input for 1996 Annual Command History, May 5, 1997, Enclosure MC.

¹²⁷ Directorate of Public Works, Input for 1996 Annual Command History, May 5, 1997, Enclosure I.

¹²⁸ Directorate of Public Works, Input for 1996 Annual Command History, May 5, 1997, Enclosure M; Briefing slides of EQCC Meeting, August 21, 1996.

utilized for future construction. In 1996, 53 such buildings totaling 240, 497 square feet were demolished.¹²⁹

Not all such demolition was popular, however. Some buildings held fond memories for veterans and long serving employees, who believed that preserving the structures preserved a piece of the post's heritage. The TAHO Club was an example. Initially built in World War I as an airplane hangar, the structure had undergone numerous physical changes and had been moved. In the 1960s it was established as a youth recreation center and subsequently became known as the TAHO Club. It became a popular haunt for teenagers and well-known on post. By 1996, however, it had become one of hundreds of structures recommended for destruction. In July it underwent demolition.¹³⁰

To facilitate disposal of the demolition debris Fort Knox applied for and received a permit to convert the existing residential landfill into one suited to construction/demolition debris. This action meant that the post would be spared the expense of hauling the debris to a remote landfill off post. The converted landfill will provide 1,243,000 cubic yards for debris disposal. It is specifically intended to handle the waste from increased demolition of wooden buildings, but it is expected to serve Fort Knox for about twenty years.¹³¹

Financing Change

General Maggart always considered the budgetary status of Fort Knox to be robust. He believed the post received sufficient funding; it simply needed to use these funds more efficiently. His functions review and strategic planning tried to prepare both a short and long-term mechanism to ensure this change occurred and would not be reversed. Yet Fort Knox faced the prospect of unpleasant financial problems in FY 1997 for which no simple remedy existed. Figure 3.6 shows the level of appropriations received in FY 1996 and those appropriations projected for FY 1997 with a net decrease of \$48.3 million.¹³²

Figure 3.6: FY 1996 and FY 1997 Appropriations¹³³

Appropriation Type	FY 1996	FY 1997
Operations and Maintenance, Army (TRADOC and FORSCOM)	\$218.5 M	\$167.0 M
Army Family Housing	\$24.4 M	\$17.5 M
Reserve Personnel, Army	\$4.1 M	\$4.4 M
TOTAL	\$247.9 M	\$188.9 M

The deactivation of the 194th Separate Armored Brigade in 1995 only intensified the impact of this decline, since its personnel, equipment, and separate funding no longer supported USAARMC activities. In fact 1996 witnessed the initial impact of Fort Knox losing access to alternate sources of funding. Increasingly the post had only the amount provided by TRADOC to sustain itself; an amount shrinking with each year as TRADOC struggled with its own unruly balance sheet.

Financing quality of life functions, especially in the areas of Morale, Welfare, and Recreation, became increasingly difficult. These activities are categorized by Congress according to the relative levels of non-appropriated and appropriated funding used. Of particular concern to the post are those activities listed as Category C, which includes the clubs, and Category B that includes child care services, Army Community Theater, arts and crafts, sports activities, youth services, etc. Their nature makes Category B activities labor intensive and expensive because of the wages and benefits that must be paid.¹³⁴

¹²⁹ Notes of Fort Knox Update, September 10, 1996; Directorate of Public Works, Input for 1996 Annual Command History, May 5, 1997, Enclosure B.

¹³⁰ Paul W. Urbahns, "Knox TAHO Club demolished," *Inside the Turret*, July 18, 1996, p. 7A.

¹³¹ Directorate of Public Works, Input for 1996 Annual Command History, May 5, 1997, Enclosure I; Briefing slides of EQCC Meeting, August 21, 1996.

¹³² Directorate of Resource Management, Input for 1996 Annual Command History, April 25, 1997.

¹³³ DRM, Input for 1996 Annual Command History.

¹³⁴ Dr. Robert S. Cameron, "DCFA Trends in 1996," memorandum for record, July 11, 1997, p. 1

In recent years Army funding for Category A and B activities declined. Despite the Army's emphasis upon improving the quality of life, financial constraints have resulted in cuts in funding used to support MWR activities. In response and in contrast to traditional funding patterns Congress mandated that NAF activities be financially self-sufficient or shut down. They must generate profits and secure new customers. This pressure resulted in post commanders having to make crucial decisions that affected the future of these activities. Faced with ensuring sufficient funds for training activities, commanders also had to determine how much post money would be spent to prop up NAF activities that did not generate profits but were considered important to the post community.¹³⁵

The Department of the Army responded by creating the Single Fund in 1986 to provide funds for all Category B and C activities. The Single Fund pooled the profits for all activities in these areas and applied the total against the operating costs of each one. In this manner activities like child care and the Brick Mess, which traditionally do not generate profits, can be sustained by those functions that have a healthy profit margin. Fort Knox used its Single Fund to pool and redistribute profits to prevent important but not self-sufficient organizations from being shut down.¹³⁶

Each organization covered by the Single Fund provides a continuously updated list of new equipment and minor construction needs. Known as Capital Purchase and Minor Construction, these requests are prioritized and Single Fund dollars applied against them. In this way the Single Fund purchases new equipment for its organizations who then depreciate it over the useful life of each item. Profits remaining after operational expenses are met return to the Single Fund.¹³⁷

Budget planning for the Single Fund and its component activities focused upon net income before depreciation. In the five years prior to FY 1996, however, NIBD for Single Fund activities did not significantly improve. The Single Fund's ability to cover CPMC costs diminished and new equipment purchases dropped. Inventories of materials that outlived their useful life rose. Limited incremental CPMC purchases enabled activities to continue operations but such purchases depended upon the Single Fund's NIBD remaining positive. In 1996 this figure became negative for the first time and CPMC purchases had to stop. The stockage of equipment that outlived its useful life ballooned.¹³⁸

Several factors prevented a rapid recovery by the Single Fund. The financial shortfall occurred in the same year that DA levied a 2% tax on the Single Fund and similar activities on other installations for Army-wide projects.¹³⁹ To prepare the new Guest House under construction for business, the Single Fund had set aside money for several years, thereby reducing the amount available for replacing worn out equipment.¹⁴⁰ Moreover in 1996, \$1,030,600 of this money was spent on design of the New Guest House project.¹⁴¹

By December 1996 Single Fund money had reached a nadir. The negative NIBD was worsened by the regular winter business slump that occurred when customers of the outdoor-oriented activities dropped. TRADOC, however, perceived a crisis in the Single Fund management. It threatened to assume control over the Single Fund. This action would have resulted in a rapid assessment of the profitability of all Category B and C functions and the elimination of those activities not generating a profit regardless of their impact upon the community.¹⁴²

The Fort Knox leadership convinced TRADOC to allow the post several months to rectify the financial situation. New facilities like the Rose Terrace Water Park, Anderson Covered Pool, and Armor Inn Bingo Program were expected to generate large profits that would bail out the Single Fund.¹⁴³ Realization of this

¹³⁵ Dr. Robert S. Cameron, "DCFA Trends in 1996," memorandum for record, July 11, 1997, pp. 1-2.

¹³⁶ Dr. Robert S. Cameron, "DCFA Trends in 1996," memorandum for record, July 11, 1997, p. 2; Dr. Robert S. Cameron, "Garrison Command Issues for 1996 Annual Command History," memorandum for record, August 6, 1997.

¹³⁷ Dr. Robert S. Cameron, "Single Fund," memorandum for record, July 10, 1997.

¹³⁸ Dr. Robert S. Cameron, "Single Fund," memorandum for record, July 10, 1997.

¹³⁹ Dr. Robert S. Cameron, "DCFA Trends in 1996," memorandum for record, July 11, 1997, p. 2.

¹⁴⁰ Dr. Robert S. Cameron, "Single Fund," memorandum for record, July 10, 1997.

¹⁴¹ "CPMC Guest House," in briefing slides of Single Fund Board of Directors Meeting, September 5, 1996.

¹⁴² Dr. Robert S. Cameron, "Single Fund," memorandum for record, July 10, 1997.

¹⁴³ Dr. Robert S. Cameron, "DCFA Trends in 1996," memorandum for record, July 11, 1997, p. 3.

emphasis upon future profitability, however, depended upon immediate financial survivability. The Single Fund management had prepared a series of cost cutting measures that focused upon fee adjustments and reduced business hours, including hourly child care services. It also planned to contract long distance telephone service to the barracks to generate an estimated \$300,000.¹⁴⁴ These actions, however, would not suffice and 1997 would witness the closure of the Hansen Arts and Crafts Center and the Army Community Theater Program.

Persistent problems like the club system could not be easily solved. For years the clubs had suffered from declining membership. The deglamorization of alcohol and the changing composition of the military community sharply reduced club patronage. In 1995 several clubs including the Brick Mess became open to the community and membership fees disappeared. The Armor Inn became a conference center during the day and remained open to anyone for a cover charge at night.¹⁴⁵ The Brick Mess's profitability, however, continued to decline. Changing hours of operation and managers appeared to make no significant impact. Its NIBD was -\$154,260 in FY 1996 and it remained one of the least profitable operations on post.¹⁴⁶

Opening the club to the community did not attract large numbers of customers. The club continued to be seen as an officer's club by enlisted personnel, and its proximity to the post headquarters reinforced this perception. Senior enlisted personnel preferred the Rocker II NCO Club that lacked the formality of the Brick Mess. The Rocker II remained the most successful business activity included in the Single Fund. In FY 1996 the club generated an NIBD of \$149,300. These profits represented a key source of income for the Single Fund.¹⁴⁷

The Brick Mess's value lies in its use as a hosting facility for key visitors and as a place to represent the post. Banqueting functions, however, require an expensive formal dining facility that cannot be sustained by the normal customer base. The desire to retain the Brick Mess as a hosting facility led to the rejection of suggestions to make it a conference center like the Armor Inn. By year's end the problem of the club had not been resolved, despite an unprecedented invitation to the public to suggest ideas to make the club more financially viable. The post newspaper encouraged people to bring their ideas to DCFA Deputy Director Charlie Brown and discuss them in person.¹⁴⁸ A practical viable solution, however, did not result.

¹⁴⁴ COL Douglas M. Harris, ATZK-CFM (15-1a), "Report of Proceedings of the Fort Knox Single Fund board of Directors," September 6, 1996.

¹⁴⁵ Dr. James W. Williams, "US Army Armor Center and Fort Knox 1995 Annual Command History, draft, June 3, 1997, pp. 5-21 through 5-22.

¹⁴⁶ "Installation Morale, Welfare & Recreation," briefing slides of Board of Directors Meeting, September 5, 1996.

¹⁴⁷ Dr. Robert S. Cameron, "DCFA Trends in 1996," memorandum for record, July 11, 1997, p. 3; "Installation Morale, Welfare & Recreation," briefing slides of Board of Directors Meeting, September 5, 1996.

¹⁴⁸ Directorate of Community and Family Activities, "Brick Mess hit hard by series of changes," Inside the Turret, June 20, 1996, pp. 1A, 20A.

CHAPTER 4 SYNOPSIS

This chapter shows the training activities and initiatives undertaken by the Armor Center in 1996. It highlights the linkage between Fort Knox's efforts and ongoing TRADOC training reforms.

Chapter 4: Training and Training Support

Training and training development showed some unusual relationships to advanced technologies. In some ways, training seemed almost immune to radical change because of the digital revolution. Experience with digital systems left little doubt that training for Force XXI would apply the basic principles that guided existing training. There was some evidence that, except in the details taught, the introduction of advanced systems into the force made no difference to training entry-level Armor soldiers. Yet changes would occur. Advanced technologies had proven their ability to enhance training, especially with fewer funds for live training. Cost advantages of running training exercises by simulations seemed noteworthy. The main brakes on applying advanced technologies to training seemed to be the limited resources to acquire them and uncertainties about the extent to which virtual and constructive simulations could replace live training. Efforts to resolve this issue coincided with the transformation of the digital force from a concept to reality.

TRADOC and Training Development

Since its creation in 1973 TRADOC played a key role in preparing the Army for war. It drove the training revolution that brought the Army out of its post-Vietnam War slump and contributed to the battlefield successes of the Gulf War.¹ It now provided guidance for Army training in the Information Age amid financial constraints and personnel limitations. Like other government organizations facing resource constraints but no shrinkage of work load, TRADOC sought to change simultaneously its organization and operation to achieve efficiencies. The importance of this restructuring led to TRADOC's designation as a reinvention center. This act permitted TRADOC to waive obstructive regulations that prevented the adoption of new ideas and procedures.²

Force XXI provided the vision for transforming the Army to operate in the Information Age. It comprised Joint Venture, Army digitization, and reengineering the Institutional Army. TRADOC supported this vision through three principal initiatives: Warfighter XXI to address changes in unit training and facilitate Joint Venture; WARNET XXI to link training, acquisition, new equipment training, and training support products; and Warrior XXI to provide the focus necessary for reengineering the Institutional Army. The Institutional Army constituted the Army's training base and its capability to develop and implement new ideas. Warrior XXI thus became a key focus of TRADOC throughout 1996.³

Warrior XXI outlined how TRADOC would adjust to the post-Cold War era. It assumed that resource and environmental constraints would continue indefinitely. It further considered the current TRADOC organization too much a Cold War relic, postured to support a large army deployed throughout the world rather than a small CONUS-based power projection force. The Army's downsizing in the 1990s had left TRADOC with too many scattered installations to be efficient. Warrior XXI outlined a process of change that would streamline TRADOC and increase its ability to support Force XXI. The plan advocated reducing the number of TRADOC installations, consolidating functions, merging military occupational specialties (MOS), relying more upon technology in training, and digitizing training materials. By 2010 Warrior XXI anticipated TRADOC becoming a collection of digitally networked organizations reengineered to meet Army training needs and characterized by the application of Information Age technologies. Figure 4.1 illustrates the principal initiatives of Warrior XXI.⁴

¹ General William R. Richardson (Ret.), "The 'Training Revolution' that Built Today's Army," *Army*, 46, 9 (September 1996) 8-12.

² ATCS, "TRADOC Reinvention," memorandum, August 21, 1995; For further discussion see Dr. James W. Williams, "US Army Armor Center and Fort Knox 1995 Annual Command History, June 3, 1997, p. 1-12.

³ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, pp. 1-2.

⁴ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, pp. 3-6.

Figure 4.1: Warrior XXI Initiatives⁵

Initiative	Description
Total Army School System	Ongoing restructuring to link RC and TRADOC school systems.
Centers and Satellites	Evolving effort to align battlefield functions with training infrastructure. Center provides administrative and support functions to subordinate schools; serves as focal point for joint and combined arms training; provides non function-specific training. Satellites are separate schools that provide function specific training. Multiple satellites associated with a center similar to grouping of colleges within a civilian university.
Classroom XXI	The use of Information Age technology to move the classroom to the battlefield. Characterized by world-wide accessibility to digital information, training, and simulation delivered in multimedia format.
Distance Learning	Provide remote instruction to soldier wherever needed via interactive video or computer-based multimedia program.
Automation/Digitization	Integration of technology into training and education. Activities range from text digitization to interactive simulation exercises. Enhance simulation training by linking multiple units on same network.
Training Development	Maximizing the utility/efficiency of existing training resources, including training development personnel.
Advanced Training Strategies	Permit on-demand training for important but not continuously used tasks. Provide deployable training packages. Permit use of alternative training strategies such as consolidation of task training for skills common to enlisted, commissioned, and civilian personnel.
Diagnostics	Classroom without walls; electronic means of evaluation, certification, and task proficiency.

Warrior XXI relied upon technology and reengineering as the means of creating a smaller but more effective training institution. The plan recognized the need for TRADOC to develop a better resourcing model. The practice of resourcing schools on the basis of contact hours between students and instructors had to be eliminated. This practice discouraged schools from investing in new technology or departing from their emphasis upon costly residence training to embrace distance learning. Warrior XXI also acknowledged the impact of downsizing upon training staffs and faculties. Since FY 1992 civilian training personnel suffered a cut of 49% while military personnel dropped 29%. Warrior XXI recommended that the survivors be given training opportunities similar to those offered the soldier in the field via distance learning and Classroom XXI technologies.⁶

Warrior XXI goals for the period FY 1998-2003 focused upon restructuring TRADOC to support Force XXI. TRADOC would be reorganized into centers corresponding to the key elements of the Army and subordinate satellites. Training installations would be linked to each other and units in the field via an information architecture yet to be built. TRADOC believed this architecture would increase the accessibility of its schools, training opportunities, and information. Moreover, these actions would become the basis for future training developments. TRADOC's reorganization into centers and satellites represented an investment in the future. Some installations would suffer a decline in status, especially if reduced to a satellite. Fort Knox, however, would become a center and retain its central influence upon the Mounted Force.⁷

⁵ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, pp. 3-6.

⁶ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, pp. 26-28.

⁷ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, pp. 34-35; Dr. Robert S. Cameron, Interview with COL Jerry L. Veach, September 6, 1996.

Force XXI Training Program

Warrior XXI underwent continuous change in 1996, but its basic trends remained constant. These trends helped installations within TRADOC to posture themselves for the future. Indeed, local activities often anticipated the direction of changes in TRADOC. For Force XXI training efforts, Warrior XXI provided additional focus. It did not result in major changes to training initiatives already underway. At Fort Knox the basic elements of Warrior XXI outlined in Figure 4.1 found reflection in ongoing Armor Center activities. Following earlier TRADOC guidance and its own initiative, the Armor Center's Force XXI Training Program continued to influence the preparation of digital soldiers. Like Warrior XXI, however, the details of this training evolved throughout the year.

The Force XXI Training Program comprised part of an army-wide initiative to integrate combined arms doctrine, training, and technology into a single program.⁸ Its development followed guidance from the TRADOC commander in 1994 to develop an optimum mix of simulation and live training to intensify training and sustain combat readiness. Training cycles were to be streamlined through the use of advanced technologies. The Army Chief of Staff further directed special attention be given to staff development and critical combat functions. Proponency for the program lay with the Armor Center, which would coordinate its actions with the other TRADOC centers and schools.⁹

The first products completed under this program in FY 1994 and FY 1995 focused upon brigade and battalion/task force staff and unit training. The program also was linked to RC training developments based upon Simitar. In FY 1996 the program focused upon linking simulator facilities on post, further refinement of training strategies, evaluating training effectiveness, and building the electronic architecture to support the completed program. For FY 1997 the program envisioned adding staff training exercises to include combat support and combat service support for the BN/TF staff and expanding its ability to support brigade level training. It would also develop the training support packages for the CCTT.¹⁰

The program developed by the Armor Center derived from the Force XXI vision. It reflected the belief that better training could be achieved in shorter cycles with the same platforms being used for training, research, and development. Once fully implemented, this program would reshape the nature of Army training and enhance its battlefield effectiveness. It incorporated insights from Desert Hammer VI and Advanced Warfighting Experiment (AWE) Focused Dispatch.¹¹ The Force XXI Training Program also applied the structured, task-based training methodology developed for the Virtual Training Program (VTP). It included combined arms, digital, and mixed digital and conventional operations.¹² The program addressed training from the individual soldier to the brigade. The training cycle for officers included JANUS and BBS constructive exercises, followed by complex virtual battles in preparation for live training. The final test of ability, however, remained a rotation at a combat training center.¹³

Deficiencies existed in officer training. General Maggart considered the existing officer training program weak in its instruction of staff and commander tasks. Armor School Chief of Staff COL Paul Lenze agreed. Although the Army expected to fight as combined arms teams, the team elements did not train together. Nowhere were combined arms commanders trained at the brigade or below level. At these levels he considered the Army ill-equipped to conduct integrated operations.¹⁴

⁸ MG Lon E. Maggart, "Force XXI Training Program," slide in briefing entitled "Fort Knox Overview for MG George H. Harmeyer," 1996.

⁹ DTDD, "Force XXI Training Program: Program Update for the Commanding General," briefing slides, July 1996.

¹⁰ DTDD, "Force XXI Training Program: Program Update for the Commanding General," briefing slides, July 1996.

¹¹ MG Lon E. Maggart, "Fort Knox Overview for MG George H. Harmeyer," briefing slides, 1996.

¹² MG Lon E. Maggart, "Fort Knox Overview for MG George H. Harmeyer," briefing slides, 1996.

¹³ MG Lon E. Maggart, "Collective Staff/Unit Training," slide in briefing package entitled "Fort Knox Briefings, General Reimer CSA," 1996.

¹⁴ Dr. Robert S. Cameron, Interview with COL Paul Lenze, August 16, 1996.

General Maggart sought to remedy this weakness through development of a training program suited to commanders and staffs and one that addressed combined arms training.¹⁵ TRADOC's Warrior XXI plan embraced multibranch courses and interservice training. Such training anticipated the use of seamless simulation technologies capable of linking multiple unit types in a single simulation.¹⁶ AWE Focused Dispatch demonstrated the viability of this concept.¹⁷ General Maggart helped build this emphasis into the Force XXI Training Program. Accepting the TRADOC slogan "train as you fight," he believed a doctrine that embraced team operations and combined arms actions should be supported by a training program with a similar emphasis. He noted the Army's lack of a process for training the combined arms team, and he undertook the development of a combined arms training strategy while still the Armor Center DCG. This strategy encouraged an active effort by the Armor Center in general and General Maggart in particular to obtain input from other branches for the Force XXI Training Program.¹⁸ General Harmeyer continued this effort, actively seeking cooperation on a host of Armor Center projects.¹⁹

To assist the development of effective staff officers, the Force XXI Training Program included ongoing efforts to build an Army Virtual Brigade. This project received Congressional support starting in 1994. The Virtual Brigade would rely upon simulation to accelerate force development activities, enhance the quality of training, and conserve resources. It built upon the existing simulators and facilities at Fort Knox and exploited the post's cadre experience and operational data base. In FY 1994 \$15 million RDT&E funds were approved to perform a front-end analysis and develop a training strategy that included the requisite simulation facilities. In FY 1995 Congress recommended an additional \$16.5 million to continue the project, reflecting its belief that the project held significant promise as a testbed for training technology and concepts. This money fueled planning, the upgrading of facilities, and ensuring that the simulation technology to be used would be interoperable. The name changed to Brigade and Below Simulations Training Program, and it became an important part of the Force XXI Training Program. It specifically addressed the command and staff functions from the platoon through the brigade level across the mission spectrum. While most existing simulation training strategies addressed the basic operations of movement to contact, defense of a battle position or sector, and deliberate attack, B2STP would expand this scope to ultimately include exploitation, pursuit, delay, and withdrawal operations. It focused its training strategies to the specific needs of each command echelon.²⁰

The Force XXI Training Program also represented a laboratory for new concepts that could be immediately incorporated into training activities. Through simulations, proposed changes in tactics, techniques, and procedures (TTP) could be tested with systems and hardware not yet produced.²¹ In 1996 the key training tasks identified for the Force XXI Training Program also provided guidance in the training of those units tagged to test the effectiveness of a digital task force in 1997. Collectively these units formed the EXFOR, based at Fort Hood, Texas, and responsible for testing digital technologies and operations against a conventionally equipped OPFOR at the NTC.²²

The Force XXI Training Program embraced emerging technologies. The program envisioned a much higher use of virtual and constructive simulation than current training, although determining the right mix of live, virtual, and constructive training remained an elusive goal. By greatly increasing the amount of virtual and constructive training, a 246-day training year can be shortened to four months. The heavier reliance upon simulation training (see Figure 4.2) would generate a time and cost savings. More training iterations

¹⁵ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, October 11, 1996.

¹⁶ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, pp. 8-9, 19.

¹⁷ For additional information on AWE Focused Dispatch, see Dr. James W. Williams, "U.S. Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, Chapter II: Realizing Visions—Doctrine (Part B): Experimentation.

¹⁸ Dr. James W. Williams, Interview with MG Lon E. Maggart, December 5, 1995, pp. 12-13; Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 13, 1996.

¹⁹ Notes of May 20, 1997 Fort Knox Leadership Off-Site Meeting, Opening Remarks of CG, May 27, 1997.

²⁰ DTDD, "Force XXI Training Program: Program Update for the Commanding General," briefing slides, July 1996.

²¹ Dr. Robert S. Cameron, Interview with COL Jerry L. Veach, September 6, 1996.

²² MG Lon E. Maggart, "Fort Knox Overview for MG George H. Harmeyer," briefing slides, 1996.

that included more tasks could be performed annually. Although field training would not be eliminated, simulation would replace live activities wherever possible without jeopardizing the realism of training. Simulation activities required less time to set-up and run, could be repeated, and cost a fraction of similar live exercises. In this way, a training cycle that prior to the Gulf War allowed only one platoon, one company, and one battalion exercise per iteration would be changed to include three exercises at each command level. Moreover, much of this training would be accomplished via a distributed simulation capability. Units at different posts could participate in same exercise. The resultant combined arms feel in turn would enhance the training's realism.²³

Figure 4.2: Distribution of Training Time

Nature of Training	Current	Evolving	Force XXI
<i>Virtual</i>	10%	30%	50%
<i>Constructive</i>	20%	40%	25%
<i>Live</i>	70%	30%	25%

Greater use of simulations generated a demand for new data bases and software products. Much of the Force XXI Training Program in 1996 focused upon developing and testing these products. Of particular importance were complete scenario packages intended for distribution to field units. These packages included ready-made scenarios with OPFOR elements and operations orders. Although a unit could modify scenario parameters to suit specific training needs, it could minimize the time spent preparing for an operation. By providing complete training packages for each type of simulation technology, the Armor Center sought to allow an intensified training period for both RC and AC personnel. Minimal administrative needs meant more training exercises in any given period of time. Although these products were intended to be self-explanatory, the Armor Center accompanied each product delivery to a unit with a representative. The latter explained the product's use and also collected data on its use. This data then guided the development of newer training packages.²⁴

Despite the simulation-heavy nature of the Force XXI Training Program, the Armor Center tried to retain a focus upon soldiers rather than machines. General Maggart deliberately sought to prevent simulation usage from eroding warfighting spirit. Instilling this spirit he considered a priority training goal, fearing that its absence would undermine combat effectiveness.²⁵ To prevent this erosion, crew-level and small group instruction that applied lessons learned at the CTCs continued to characterize instruction.²⁶ To ensure that matériel and doctrine remained relevant and soldier-oriented, the Armor Center utilized a process known as User-Jury. Soldiers assigned to Fort Knox first tested new equipment and concepts in simulations. Their feedback then guided further developments prior to distribution to the field. General Harmeyer continued these efforts, but also emphasized the importance of continuing to teach soldiers basic fieldcraft.²⁷

The training challenge of Force XXI stemmed from the need to train soldiers in more tasks simultaneous with reducing training cycles. Soldiers and officers had to possess basic competency in technical and tactical skills in the same manner as preceding generations of soldiers. However, they also had to learn how to exploit the new digital equipment and master multimedia communications. While

²³ MG Lon E. Maggart, "The Annual Training Plan: A New Approach," slide in briefing package entitled "Fort Knox Briefings, General Reimer CSA," 1996.

²⁴ DTDD, "Force XXI Training Program: Program Update for the Commanding General," briefing slides, July 1996; DTDD, Force XXI Training Program briefing for MG Robert Ivany, September 22, 1997; DTDD, "Force XXI Training Program," April 17, 1997, internet source: <http://147.238.100.101/center/fxxitp/fxxitp.htm>.

²⁵ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, October 11, 1996.

²⁶ MG Lon E. Maggart, "Armor Center Mounted Training Concepts," slide in briefing package entitled "Fort Knox Briefings, General Reimer CSA," 1996.

²⁷ Dr. Robert S. Cameron, Interview with MG George H. Harmeyer, March 3, 1997.

these skills posed less of a challenge to a generation raised on computers and video arcades, the need for digital and non-digital skills made the learning process more complex than in the past. Soldiers had to be versatile enough to rapidly shift from digital to non-digital operations, while leaders had to train themselves to a new means of envisioning the battlefield without becoming fixated upon their computers.²⁸

Close Combat Tactical Trainer

The merging of a combined arms emphasis and a training program that increased use of simulation technology required a new simulator. SIMNET had been built to provide training for the M1 tank, and although still useful for tank platoon and company operations, it did not permit true combined arms operations. Its interior configuration reflected the earlier version of the Abrams tank, not the digitized M1A2. Technical limitations limited the variables that could be applied to shape the battlefield environment. It was always a sunny, clear day in SIMNET, but rarely so in the real world in which tankers could expect to operate.

Simulation, Training and Instrumentation Command (STRICOM) had already begun development of a new Combined Arms Tactical Trainer family of virtual trainers to support the Force XXI Training Program. These simulators also symbolized Army efforts to reduce the environmental and financial cost of training.²⁹ STRICOM sought to develop separate simulators for each of the battlefield operating systems. Their interoperability would support the growth of combined arms training strategies. These trainers represented a significant advance over SIMNET, permitting all-weather and night operations.³⁰ Initial CATT development focused upon the Close Combat Tactical Trainer (CCTT). This trainer included a series of full-crew interactive simulators configured to represent more accurately those vehicles principally used by the Mounted Force: M1A1 and M1A2; M2/M3A2; FIST-V; M113A3; and the HMMWV. While similar in outward appearance to the SIMNET simulators, the newer Bradley and Abrams simulators permitted a broader range of crew actions, including open-hatch operation. Each simulator linked to computer workstations representing the Tactical Operations Center of a battalion. This TOC controlled CS and CSS forces that actually represented in operations, and not simply inferred. Fire support and logistical considerations thus were expected to occupy more of a commander's attention than previously. This emphasis would help to overcome repeated NTC criticism of units failing to effectively incorporate these factors into their operational planning process. CCTT also included dismounted forces, unlike SIMNET.³¹

STRICOM expected CCTT to support over 80% of the principal tasks assigned to Mounted Force elements. Its planned availability included armor, mechanized infantry, and cavalry units at the platoon through battalion/task force levels.³² In preparation for fielding of the CCTT in 1997, the Armor Center

²⁸ MG Lon E. Maggart, "Soldiers," slide in briefing package entitled "Fort Knox Briefings, General Reimer CSA," 1996.

²⁹ "Why Does the Future Total Army Need a Virtual Combined Arms Trainer?" briefing slide in Armor Trainer Update, 1996; "CATT Concept," briefing slide in Armor Trainer Update, 1996.

³⁰ "CATT Challenge," briefing slide in Armor Trainer Update, 1996; "CATT Core Evolution," briefing slide in Armor Trainer Update, 1996; "CATT Core Opportunity Today," briefing slide in Armor Trainer Update, 1996.

³¹ Center for Army Lessons Learned, NTC Priority Trends: A Compendium of Trends with Techniques and Procedures that Work!, 4QFY94 through 2QFY96, 1996; Center for Army Lessons Learned, NTC Trend Analysis, No. 97-3, 4QFY94 to 2QFY96, January 1997; "Close Combat Tactical Trainer," May 22, 1997, internet source: <http://www.stricom.army.mil/STRICOM/PM-CATT/ccct.html>; US Army Corps of Engineers, "Close Combat Tactical Trainer (CCTT)," Fact sheet, internet source: http://www.tec.army.mil/fact_sheet/close.html; U.S. Army Topographic Engineering Center, "Close Combat Tactical Trainer," internet source: <http://www.tec.army.mil/TD/ccct/ccct.html>; Dr. Robert S. Cameron, Notes of briefing of Mounted Warfare Simulation Training Center, 1997.

³² "Close Combat Tactical Trainer," May, 22, 1997, internet source:

<http://www.stricom.army.mil/STRICOM/PM-CATT/ccct.html>; US Army Corps of Engineers, "Close Combat

began preparation of basic training exercises for use with the new device and tested its ability to "train the trainer."³³ Fielding plans included production of 560 CCTT to start in 1997, but Forts Hood and Knox received several prototype trainers—including M1A2 simulators—in 1996 for operational testing. Fort Knox also received reconfigurable HMMWV simulators that could be linked with SIMNET and changed to represent M88 recovery vehicles or M113s. COL Ritter, the director of training and doctrine development, opposed further development of the reconfigurable simulators. He believed the resources allocated to their development could be better used elsewhere, since CCTT provided superior capabilities.³⁴ For the RC, however, reconfigurable simulators offered a cost-effective alternative to the CCTT.

CCTT fielding plans envisioned its distribution in company-sized sets to 11 CONUS and OCONUS fixed sites, including Fort Knox. In addition, twenty-one mobile platoon sets would provide the National Guard CCTT access at their home stations. Further CCTTs will be made available to support units deployed overseas on contingency operations.³⁵

Classroom XXI and Distance Learning Initiatives

Warrior XXI placed emphasis upon Classroom XXI and distance learning initiatives. Classroom XXI utilized emerging communications technologies to permit world-wide access to digital information, training, and simulations. These technologies enabled subject matter experts in particular training areas to teach students far from the school in real time. Classes could be taught in the schools and other locations simultaneously. It effectively brought the classroom to the battlefield and vice versa. It relied upon multimedia, video teletraining, and internet capabilities. This concept depended upon the existence of the necessary communication links between centers, satellites, combat training centers, and units in the active and reserve components. In 1996 much of this linkage had yet to be built. The first step lay in linking the schools to eliminate the requirement that officers be physically present in a classroom to teach branch-specific doctrine. Subsequently, the schools would be linked to the field.³⁶

The Armor Center had been building its Classroom XXI abilities for the past several years. In fact the Warrior XXI draft plan specifically cited the Cavalry Leaders Course as an example of its Classroom XXI initiative. This course was electronically linked with the National Training Center and the Infantry, Field Artillery, Military Intelligence, and Combat Service Support Schools for instruction on combined arms operations. The instructor taught at Fort Knox but received support from subject matter experts at the other schools and insights from an observer/controller at the NTC. Despite the geographic separation of the instructing personnel all were accessible to the students via multimedia links for questions and elaboration, enhancing the value of the instruction. TRADOC envisioned similar applications throughout its school system.³⁷

Tactical Trainer (CCTT)," Fact sheet, internet source: http://www.tec.army.mil/fact_sheet/close.html; U.S. Army Topographic Engineering Center, "Close Combat Tactical Trainer," internet source: <http://www.tec.army.mil/TD/cctt/cctt.html>.

³³ "CCTT Training Support Packages," briefing slide in Armor Trainer Update, 1996; "Terrain Data Bases," briefing slide in Armor Trainer Update, 1996.

³⁴ MAJ Gary A. Harber, ATZK-SA, "Meeting Notes," memorandum for record, June 6, 1996; US Army Corps of Engineers, "Close Combat Tactical Trainer (CCTT)," Fact sheet, internet source: http://www.tec.army.mil/fact_sheet/close.html; SPC Rhonda Marie Jones, "SIMNET Expansion Brings 'Enhancement to Training,'" *Inside the Turret*, February 22, 1996, p. 2A.

³⁵ ["Close Combat Tactical Trainer," May 22, 1997, internet source: <http://www.stricom.army.mil/STRICOM/PM-CATT/cctt.html>; US Army Corps of Engineers, "Close Combat Tactical Trainer (CCTT)," Fact sheet, internet source: http://www.tec.army.mil/fact_sheet/close.html; U.S. Army Topographic Engineering Center, "Close Combat Tactical Trainer," internet source: <http://www.tec.army.mil/TD/cctt/cctt.html>.

³⁶ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, pp. 13-14.

³⁷ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, p. 13.

Distance learning is a concept of delivering training to soldiers when and where they need it. It relies upon emerging technologies to package and deliver training products to soldiers. Its principal forms include the computer-based multimedia program and the interactive video. Both forms permit export. Distance learning supplements Classroom XXI by exporting training in specific subject areas to a soldier at his home station or deployed overseas. Distance learning packages can also be used at times convenient to the soldier's ongoing duties. The Army's budget limits effectively limited the ability of RC and AC units to move to a school for training. Distance learning provided a plausible workaround and continued to be a growing trend within the Army. Future training would be designed for export to the soldiers.³⁸

During 1996 Fort Knox continued to expand its range of distance learning products. The M3 Scout Commander Certification Course had been canceled for budgetary reasons. In response to requests from the field that the course be reinstated, the Armor School converted it into an exportable package that could be taught elsewhere, including a unit's home station. The Staff and Faculty Development Branch also converted its Instructor Training Course to an exportable multimedia format. It anticipated future downsizing that might force the course to be cut from the Armor School course offerings.³⁹ The NCOA continued to study its own courses for possible conversion into distance learning formats.⁴⁰

Automation and Digitization

Representative of TRADOC's efforts to exploit Information Age technologies was the inclusion of automation and digitization as a principle initiative in its Warrior XXI plan. The term addressed a broad range of activities from the simple conversion of paper texts to digital format to the creation and world-wide use of interactive simulations. The initiative included greater use of CD-ROM technology to store data and manuals otherwise too costly to print and publish and cumbersome to store. Such information could then be placed on-line for rapid distribution and access. This initiative paralleled trends throughout the federal government.

The first step toward placing the Armor Officer Advanced Course on-line also occurred in 1996. The entire course content with points of contact went on the internet. The AOAC home page appeared providing officers scheduled to arrive at Fort Knox for the course or considering it the chance to review the course's content. They could also ask questions to key personnel about it.⁴¹ This action marked the first step in a process intended to transform AOAC into an exportable class conducted at home stations and via an internet "chat" line.⁴²

The Armor School Library continued development of the Armor Research Center. The Center's purpose lies in organizing branch-specific and unique materials into a single, organized data base for use by students, training developers, and researchers. Its completion will permit simplified access and use of the Army's only collection of published works and primary source material dedicated exclusively to Armor. Development of the Center comprises three parts:

- Phase 1: automation of the Armor School Library collection and creation of a single data base for the holdings of the Barr Memorial and Armor School Libraries.

- Phase 2: automating the Patton Museum collection and adding it to the existing data base.

- Phase 3: digitizing key historical files, acquiring the infrastructure to permit future input of documents directly into the data base, and permitting on-line access to the data base files to select users.

³⁸ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, pp. 14-15.

³⁹ Armor School, Input for the 1996 Annual Command History, June 9, 1997.

⁴⁰ NCOA, Input for the 1996 Annual Command History, June 23, 1997.

⁴¹ "Armor and AOAC Are Going on the Internet," *Armor*, CV, 3 (May-June 1996) 42.

⁴² COL Gregory Eckert, "Officer Training," briefing given during 1997 Armor Conference, June 5, 1997.

Phase 1 was approved and funded with FY 1995 year-end funds. The single data base was created and installed in 1996. Phases 2 and 3, however, remained unfunded at the year's end. The accomplishments completed, however, were done with a Library staff that shrank from five to four with no drop in mission load.⁴³

Active and Reserve Component Integration

Army efforts to adjust to the post Cold War environment and its downsizing forced a greater reliance upon the reserve component. Downsizing projections anticipated seventy percent of combat support and combat service support elements being in the reserve component. The AC cannot conduct contingency operations and fight the two simultaneous major regional conflicts dictated by the National Military Strategy without this support. Awareness of the Army's dependence upon the RC spurred efforts to integrate them with the AC to create one Total Army with one set of training standards and one school system.⁴⁴

The Total Army School System was a near-term objective of the Warrior XXI plan. It involved restructuring the Regional Schools of the RC and linking them to the TRADOC school system. Its purpose lay in providing uniform training for the AC and RC and implementing a single set of training standards for both components.⁴⁵ In accomplishing these goals, the Total Army School System sought to establish a single system of accredited and integrated schools for the active and reserve components. These schools would provide standard individual training and education for the entire Army. The Total Army School System also sought to ensure continued training effectiveness despite declining dollars and eliminate imbalances in the quality of instruction provided by existing RC schools.⁴⁶

TASS divided the continental United States into seven regions. Each region included six RC brigades responsible for supervising instruction. Each brigade included battalions aligned with particular career management fields and responsible for managing instructor groups. These groups in turn provided instruction at specified locations within their region. Coordinating elements in each region oversaw all training, provided accreditation, certified instructors, and developed course materials. AC personnel comprised these regional coordinating elements. TRADOC coordinated training activities nation-wide, while its schools supervised the appropriate branch training given.⁴⁷ The Armor Center oversaw TASS instruction and provided the coordinating element in Region D, spanning the states of Mississippi, Alabama, Tennessee, and Kentucky. In addition it provided quality control for armor instruction throughout the country.⁴⁸

Creating a Total Army with only one standard meant providing the RC access to the same instruction offered the AC. Such accessibility required the conversion of AC courses into a standard format known as the Total Army Training System that could be rapidly disseminated and taught at a remote site. The Fort Knox NCOA began this process in 1996. Conversion, however, required changes in the course itself to accommodate standardization. The Advanced NCO Course for Armor Crewman and Cavalry Scout, for example, began a complete revision prior to TATS conversion. It sought feedback from the field requiring those tasks to be included in the course to ensure effective instruction for RC and AC personnel serving in

⁴³ Armor School, Input for the 1996 Annual Command History, June 9, 1997, Armor School Library.

⁴⁴ "The Army's Active and Reserve Component Integration," *Army*, 46, 6 (June 1996) 13-16; Dr. James W. Williams, "U.S. Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, pp. 4-7 and 4-8.

⁴⁵ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, pp. 10-11.

⁴⁶ Regional Coordinating Element D, "Total Army School System," briefing slides presented during Armor Trainer Update, 1996.

⁴⁷ Regional Coordinating Element D, "Total Army School System," briefing slides presented during Armor Trainer Update, 1996; TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, p. 10.

⁴⁸ Regional Coordinating Element D, "Total Army School System," briefing slides presented during Armor Trainer Update, 1996.

armor battalions, cavalry squadrons, and separate cavalry troops. This feedback would shape the course's final form.⁴⁹

While TASS linked the RC and TRADOC schools together, Army restructuring in the wake of the Gulf War created an imbalance between combat and support forces. Insufficient combat support and service support existed. The Total Army Analysis 2003 completed in March 1996 placed the shortfall at 124,800 soldiers. In response the Army planned to convert 66,400 spaces from combat to support roles, primarily in the Army Reserves. The NG division redesign study addressed the remaining deficit. This study required low priority combat units to become support units. The NG would inactivate twelve brigades, using their personnel and equipment to form two combined arms brigades and six combat support and combat service support brigades. This action would reduce the shortfall in support soldiers to the acceptable risk level of 15,700. These changes impacted the National Guard's force structure as outlined in Figure 4.3.⁵⁰

Figure 4.3: Changing the National Guard Force Structure

Organization	Current Force Structure	Division Redesign Study Recommendation
Division	8	8
Enhanced Brigade	15	6
Separate Brigade	2	6

The division redesign study also called for the composition of NG divisions to change. Three would retain their existing organization, three would inactivate one existing brigade and replace it with an enhanced brigade, and the other two would comprise AC and RC personnel. AC personnel would rotate through the division as part of their regular tour of duty. Such integration had been advocated in 1994, but the Army leadership then rejected the concept. It believed the cost of creating the necessary headquarters too expensive. In 1996, however, the integrated division received considerable support, including that of Secretary of the Army Togo D. West, Jr. The Adjutants General backed this action, believing it the first step toward a Total Force.⁵¹

The integrated division concept sought to bridge the cultural and capabilities gap between the AC and RC. The NG found it difficult to retain officers who understood capabilities. Too many such officers retired after their Guard assignment rather than seeking senior ranks where they could influence policy decisions. Instead policy-makers tended to have little experience with the NG. For the AC service with the Guard continued to be perceived as a blight on career prospects. Yet the integrated division offered promotion and command opportunities diminishing in a downsizing Army. The Armor Functional Area Assessment estimated that in FY 1995 only 8 field commands became available for 110 eligible officers. Service in an integrated division would increase the available command slots.⁵²

Further opportunities to obtain command experience existed with a related proposal to rotate AC officers through NG units on a regular basis. Such rotations required the AC officer to receive a state commission and would last 24 months. The command and staffs of NG units would benefit from the capabilities offered by an AC officer. Moreover, a long-term benefit would accrue from the expanding pool of AC officers familiar with the NG. The cultural gap between the AC and the NG would finally close, and

⁴⁹ NCOA, Input for the 1996 Annual Command History, June 23, 1997.

⁵⁰ Secretary of the Army Togo D. West, Jr., "Army National Guard Division Redesign Decision—Action Memorandum," memorandum, May 23, 1996; COL Allen Youngman, "An Integration Concept," Briefing slides, August 13, 1996; "The Army's Active and Reserve Component Integration," *Army*, 46, 6 (June 1996) 13-14.

⁵¹ Holly Porteous, "Integrated Divisions Get Go-Ahead From Secretary of the Army," included in *Inside the Pentagon* in *Early Bird*, August 14, 1997, p. 6.

⁵² COL Allen Youngman, "An Integration Concept," Briefing slides, August 13, 1996; Dr. Robert S. Cameron, Notes of Coordination Meeting, August 13, 1996.

the NG could anticipate and better a less antagonistic relationship with the AC. The Adjutants General would bear primary responsibility for implementing the program subject to DA approval.⁵³

General Maggart supported this proposal. At his request, it was briefed to the senior leaders at Fort Knox in August 1996. General Maggart viewed the integration plan as a means to retain the vitality and relevance of the Armor Branch despite the major loss of personnel since the fall of the Berlin Wall in 1989. Moreover AC officers could gain the command experience otherwise unavailable. The lack of such command experience had already been identified as a weakness within the branch, and it adversely affected the development of commanders and staff officers. The NG offered a utilization of manpower that General Maggart considered "a good deal for Armor." The cost, however, would be paid in a possible shortfall in Majors and LTCs who would participate in the proposed NG rotations. This cost in talent would compound the existing deficiency in branch-qualified captains.⁵⁴

To demonstrate its support of integrating the NG and AC, the Armor Center took the unprecedented step of appointing a Guardsman to a senior position. In December 1995 National Guardsman COL Jerry L. Veach became Chief of Staff. This appointment marked an important milestone in the National Guard's history and in its efforts to acquire AC recognition. General Maggart selected COL Veach based upon his abilities. Previously COL Veach headed the Office of the Special Assistant to the Commanding General, helped design Fort Knox's Virtual Training Program, and participated in development of the Force XXI Training Program. COL Veach credited General Maggart for creating a command atmosphere that made his appointment possible. He also praised General Maggart's willingness to demonstrate his support for AC/RC integration. The National Guard hoped that the appointment might establish new precedents within the Army. Moreover, General Maggart seemed to be showing how a better working relationship between the NG and the AC could be achieved in a realistic manner. Clearly the appointment marked a step toward realization of a Total Army.⁵⁵

The Army's growing reliance upon the Guard to include overseas deployments, however, bore a price. The higher deployment rate of the Army since the Cold War meant an increase in the time Guardsmen spent away from their jobs. This trend represented an economic loss that the Total Army concept did not address in 1996. The employers of RC personnel faced the unwelcome prospect of losing key personnel frequently and for longer periods of time. This trend also contradicted the public's expectation that the Cold War's end would result in soldiers spending more time at home. Figure 4.4 illustrates the deployment trend of National Guardsmen and its economic impact.

Figure 4.4: The Cost of a Higher National Guard OPTEMPO⁵⁶

Theater	FY 95 Overseas Deployments		FY 96 Overseas Deployments	
	Soldiers	Workdays Lost	Soldiers	Workdays Lost
Central Command	988	90,171	687	14,891
European Command	8,884	179,576	6,650	127,501
Pacific Command	1,662	28,638	2,602	44,609
Southern Command	10,547	178,583	10,262	179,934
Atlantic Command	1,729	12,415	558	8,188
TOTAL	23,810	489,383	20,759	375,123

⁵³ COL Allen Youngman, "An Integration Concept," Briefing slides, August 13, 1996; Dr. Robert S. Cameron, Notes of Coordination Meeting, August 13, 1996.

⁵⁴ Dr. Robert S. Cameron, Notes of Coordination Meeting, August 13, 1996; OCOA, Input for 1996 Annual Command History, May 21, 1997.

⁵⁵ Belinda Reilly, "Training for the Future; It's Not a Game," National Guard, (June 1996), 16-18, 30.

⁵⁶ National Guard Bureau Research and Staff Support Office, Fiscal Year 1997 Posture Statement, undated, pp. 15, 18, internet source: <http://132.80.130.121/p97b.htm>.

The Bosslift provided one means of helping employers of RC soldiers understand the importance of these citizen-soldiers to the national defense. The Bosslift brought employers to military posts to observe RC training and receive familiarization tours of the training facilities. The Office of the Secretary of Defense for Reserve Affairs, National Committee for Employer Support of the Guard and Reserve sponsored these activities. During a Bosslift employers talk to soldiers and seek a better understanding of the demands of military training. These activities eased the potential tension between employers and their RC personnel regularly leaving the work place for training or overseas deployment. In 1996 Fort Knox hosted two Bosslifts, Pennsylvania visited in May and Idaho visited in November.⁵⁷

The Armor Center also promoted a closer relationship between RC and AC personnel during its normal training functions. AC and RC soldiers were routinely mixed as training instructors. The Center also regularly trains reservists. In 1996 1-46 and 2-46 Infantry Battalions of the 1 ATB conducted their annual Horizontal Unit Displacement with elements of the 84th Training Division based in Wisconsin. Groups of reservists from the latter formation displaced the 1 ATB personnel and assumed their training functions during two week rotation periods. At the HUD's conclusion, 46 Infantry BN personnel evaluated the reservists in specific areas of training. The 5/15 Cavalry Squadron also conducted eight HUD missions, four with the 1/302 Cavalry and four with the 3/397 Cavalry. The HUD missions prepare reservists to assume AC duties on Fort Knox in the event of a mobilization in which the AC personnel must be supplemented or must deploy.⁵⁸

In October 1996 Company D, 2-46 Infantry BN and 2-274 Infantry BN, 84th Training Division implemented the Echo Company concept. This activity involved RC training staff and drill sergeants responsible for Initial Entry Training during Basic Combat Training. Every two weeks Company D had a new RC company assigned to it. Each company practiced their wartime mission of training IET soldiers during partial mobilization. While rehearsing their training capability, the RC soldiers also satisfied their annual training requirement. A small group of instructors from 1 ATB evaluated the RC performance and conducted an AAR for each RC company that addressed the effectiveness of the unit and individual soldiers.⁵⁹

The 1-46 and 2-46 Infantry Battalions also conducted the annual ROTC basic training camp known as Camp Challenge. Since 1987 these battalions have trained over 7000 ROTC cadets. Camp Challenge exposes cadets to the duties and responsibilities of the Army officer corps. It also seeks to keep cadets committed to the Army and seek additional opportunities within the military rather than complete their minimum obligation and return to civilian society. In 1996 Fort Knox received 1166 cadets. They were divided into three regiments and required to complete a six-week training cycle. This training included rifle marksmanship, water survival, stream crossing, rappelling, land navigation, first aid, leadership courses, and night infiltration. A graduation rate of over 90% was achieved.⁶⁰

Company F, 1-81 Armor conducted the annual JROTC summer camp. This camp exposed high school students yet to make a lasting commitment to the Army to the professionalism, duty, and importance of the Army officer corps. In 1996 Company F trained 203 cadets supervised by nine officers, nine NCOs, and five chaperones. The training period lasted one week, and it included rappelling, water survival, land navigation, stream crossing, rafting, survival techniques, and a leadership reaction course. While not as demanding as Camp Challenge, the summer camp provides an opportunity for interested youth to experience a taste of military life different from the images presented by recruiters.⁶¹

Overall the summer of 1996 witnessed an abnormally high influx of trainees. Normally, new soldiers are in-processed by the 46 AG BN and sent to 1 ATB units within four days of their arrival on post. In 1996, however, this 4-day window was closed. New soldiers remained in the care of the 46 AG BN from 1-6 weeks before joining their training unit. In response the 46 AG BN pooled its resources with the 399th

⁵⁷ PAO, Input for 1996 Annual Command History, April 25, 1997; National Committee for Employer Support of the Guard and Reserve, "Bosslifts," Fact sheet, November 15, 1996.

⁵⁸ 1 ATB, Input for 1996 Annual Command History, May 20, 1997; Dr. James W. Williams, "U.S. Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, pp. 4-4 and 4-5.

⁵⁹ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

⁶⁰ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

⁶¹ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

Reception BN and implemented a special summer training program rather than leave these new trainees idle. The program included a three-week training cycle that focused upon soldier indoctrination. RC and AC drill sergeants worked together instructing these new soldiers in drill and ceremony procedures, first aid, map reading skills, and other basic military skills. When these soldiers finally joined their training units, they tended to acclimate faster and readily accept training tasks.⁶²

Fort Knox's Virtual Reality

Training trends throughout the Army in 1996 reflected a growing reliance upon simulation to reduce training costs, sharpen basic skills, and build unit cohesion. The fidelity and interactive capability of computer simulators that emerged in the 1980s continued to increase in the 1990s, while the cost of live training continued to climb. Budget constraints encouraged the expansion of simulation training. While the Army admitted that simulators could not replace field training, Army studies nevertheless indicated that simulator usage increased the survivability of new soldiers. It provided them learning opportunities otherwise unavailable.⁶³ This assessment influenced the Warrior XXI plan and the Force XXI Training Program.

In the simulations arena, Fort Knox remained a leader. Initially its Virtual Training Program sought to improve RC training in the wake of the Gulf War. The success of the program, however, led to its application to AC as well. The simulation capabilities of Fort Knox supported this program, and the principal assets are indicated in Figure 4.5.

Figure 4.5: Principal Armor Center Simulation Assets

Asset	Training Function
Conduct of Fire Trainer	Gunnery simulator for TC-gunner team of Abrams tank and Bradley Fighting Vehicle
Unit Conduct of Fire Trainer (U-COFT)	Platoon and company fire control procedures; TC and gunner positions in simulators
Simulations Network (SIMNET)	Full-crew interactive simulator that permits platoon through BN/Task Force operations for Abrams tank and Bradley Fighting Vehicle
Platoon Gunnery Trainer (PGT)	Platoon fire control and command procedures using networked Conduct of Fire Trainers; detailed AAR capability
JANUS	BN and BDE staff trainer; focus upon collective staff operations; coordination of assets on battlefield
BBS	BN and BDE staff trainer; focus upon specific functions and actions of individual officers
Close Combat Tactical Trainer (CCTT)	Next generation of full-crew interactive simulator that permits combined arms operations from the platoon through the BN/Task Force
Driver Trainer	Driving simulator for Abrams tank

By 1996 in addition to its regular training function, the VTP became a cornerstone for the Force XXI Training Program. The challenge facing the VTP lay in the integration of increasingly sophisticated virtual technology into a structured training program. The observer/controller staff monitored, controlled, and interacted with the ongoing training activities to make them more realistic and useful. They also provided input for AARs that have become more focused. In 1996 many of these AARs became take-home

⁶² 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

⁶³ TRADOC, "Warrior XXI (Draft); Version 2," November 27, 1995, p. 18.

packages, allowing a unit to continue to the lesson-learning process after they returned to their home station.⁶⁴

Pre-made training packages also became more prevalent. These packages included scenarios, operation orders, overlays, and background information that a unit could fit to its own needs. The information and scenarios provided were based upon data obtained from the NTC. Their purpose lay in reducing the set-up and preparation time required by a unit upon its arrival at Fort Knox for training. They also provided focus and structure to simulation activities. Exportable packages that a unit could use at its home station also became available. These packages provided all the information and data necessary to run scenarios similar to those conducted at Fort Knox. They were especially intended for NG units, but they had broad applicability throughout the Army. NG units in Georgia and Idaho received the first such packages.⁶⁵

The VTP observer/controllers also increased the time spent consulting with units before their arrival at Fort Knox to provide unit-focused training programs. Of particular importance was elevating simulation training from a video-game atmosphere to battle focused training. The observer/controllers sought to prevent any repetition of the Wild West shootouts that characterized the early operation of SIMNET in which each crew fought its personal battle of survival.⁶⁶ COL Veach and General Maggart supported efforts to transform the training into a task-based structured training to maximize the value of SIMNET.⁶⁷

In 1996 the Armor Center continued to refine its task-based structured training, and it continued to attract new customers. The ability to train multiple echelons simultaneously drew many of these customers. Units regularly trained staff elements on JANUS and BBS, platoon and company elements in SIMNET, and gunnery in the U-COFT with the option of live training on Fort Knox's ranges. However, the growing versatility of the VTP and the Army's emphasis upon virtual training complicated the scheduling process. AC and RC units from all over CONUS utilized these simulators, and timing conflicts arose. Moreover, the priority status given to the NG Enhanced Brigades sometimes complicated the resolution of such problems.⁶⁸

In 1996 the VTP focused upon maximizing the hands-on time available to training units when they arrived at Fort Knox. This emphasis reflected the Armor Center's emphasis upon structured training; it also reflected the rapid increase in simulator usage. The greater demand for simulator use reduced the time available to any one unit. They had to maximize the training value of their time at Fort Knox. By the year's end this trend continued, fueled in part by the cheapness of the VTP versus live training at home stations. The NG possesses sixty-percent of the Army's armor units, but budget cuts have nearly eliminated the ability of these units to concentrate and conduct live training in their home states. The VTP remains one of the few consistently viable training options available, requiring only the cost of transporting personnel to Fort Knox. Hence the high demand for access to the VTP will continue. Figure 4.6 illustrates VTP usage trends.⁶⁹ Armor Center funding limitations, however, precluded the possibility of expanding Fort Knox's facilities to meet this demand.⁷⁰

⁶⁴ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996.

⁶⁵ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996; Belinda Reilly, "Training for the Future; It's Not a Game," National Guard, (June 1996), 16-18, 30.

⁶⁶ Belinda Reilly, "Training for the Future; It's Not a Game," National Guard, (June 1996), 16-18, 30.

⁶⁷ Dr. Robert S. Cameron, "SIMITAR," memorandum for record, August 21, 1997.

⁶⁸ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996; Belinda Reilly, "Training for the Future; It's Not a Game," National Guard, (June 1996), 16-18, 30.

⁶⁹ Belinda Reilly, "Training for the Future; It's Not a Game," National Guard, (June 1996), 16-18, 30.

⁷⁰ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996.

Figure 4.6: Recent Virtual Training Program Usage⁷¹

Training by Unit Type	FY 95		FY 96		FY 97	
	AC	RC	AC	RC	AC	RC
Tank Platoons	63	156	55	212	113	297
Scout Platoons	8	17	9	17	5	18
Mechanized Platoons	3	18	12	17	0	16
Tank Companies	20	23	17	17	24	22
Mechanized Companies	1	2	1	2	0	0
Cavalry Troops	7	2	3	1	0	6
BN/TF (JANUS)	1	13	2	17	4	10
BN/TF (SIMNET)	6	8	8	9	4	4
Total	109	239	107	292	150	373
IDT Weekends		26		28		35
Active Training Periods		4		4		9
States Represented		15		15		20

Continuing development of software packages such as SIMUTA-B helped the Armor Center to refine its virtual training. SIMUTA-B was a training support package for battalion and smaller maneuver units that could be utilized in JANUS and SIMNET. In JANUS, SIMUTA-B provided the plans and graphics for training unit staffs. In SIMNET it provided the training tables for platoon tactical training.⁷² The Armor Center developed SIMUTA-B in cooperation with the Armored Forces Research Unit of the U.S. Army Research Institute. However, a discrepancy existed between SIMUTA-B's intended emphasis upon training command echelons through the battalion and the Armor Center's actual focus upon platoon-level training. Armor School Chief of Staff COL Paul Lenze wanted to expand platoon training to include company commanders in roles other than observation. He was concerned about the failure to incorporate company and battalion commanders and staffs into unit training. This concern fueled efforts to match the Armor Center's training activities with its broader capability.⁷³

Fort Knox also participated in the development of the Simulations in Advanced Training Readiness (SIMITAR). This initiative was another key development in the ongoing efforts to build the Total Army. The Defense Advanced Research Projects Agency (DARPA) initiated this project in response to a Congressional mandate in FY 1992.⁷⁴ Congress provided \$97 million to the NG to utilize commercial products and technology to develop a new simulations-based training strategy for the NG.⁷⁵ It included a collection of pilot programs and projects to provide NG access to virtual training similar to Fort Knox's VTP at their home station. Through advanced simulations technology and training strategies, NG units would compress a week of annual training into a single weekend and improve their readiness.⁷⁶ If NG armories possessed their own virtual training capabilities, these goals seemed possible. Instead of spending 4.5 days in preparation and travel time for a half day of training at a distant post, two full days could be

⁷¹ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996.

⁷² Douglas Dilday, "SIMUTA/SIMBART Assessment," e-mail message, August 15, 1996.

⁷³ COL Paul Lenze, "SIMUTA Final Briefing," e-mail message, August 23, 1996.

⁷⁴ "SIMITAR," undated, internet source: webster.guard.state.ia.us/simtext.htm; ISO SIMITAR, "ISO Simulation Program Portfolio," undated, internet source: <http://maco.dc.isx.com/iso/simitar.html>.

⁷⁵ Dr. Robert S. Cameron, "SIMITAR," memorandum for record, August 21, 1997.

⁷⁶ "SIMITAR," undated, internet source: webster.guard.state.ia.us/simtext.htm; ISO SIMITAR, "ISO Simulation Program Portfolio," undated, internet source: <http://maco.dc.isx.com/iso/simitar.html>.

devoted to training. Refresher drills and preparation would have been completed at home station and the entire drill weekend could be devoted to training tasks.⁷⁷

SIMITAR possessed the capability to change the entire process of NG training. It included training packages that addressed battalion and brigade staff operations, combat and service support functions, and tactical engagements. Its component elements affected 41 different duty stations and 26 MOS.⁷⁸ Through use of SIMITAR products the NG sought a 200-300% increase in unit training readiness. This goal reflected the Guard's efforts to reduce mobilization time and ensure its ability to execute rapidly operations in support of the AC. Once fully established, SIMITAR would save money by making advanced training available at a soldier's home station without the need for a large support staff. Like the Force XXI Training Program, SIMITAR relied upon a training strategy based upon simulation devices and advanced technology to provide effective training that saved time and money.⁷⁹

Responsibility for testing SIMITAR's effectiveness lay with Idaho's 116th Cavalry Brigade and Georgia's 48th Infantry Brigade. These units would apply its compressed training strategy, use its computer-based instruction packages, and practice with its simulation devices before completing an NTC rotation. Based upon the data collected from these rotations, an overall assessment of SIMITAR's training value would be made.⁸⁰ While the 116th Cavalry Brigade began preparations for its 1998 rotation, the 48th Infantry Brigade completed its rotation in 1996. Evaluation of its performance focused upon 518 individual tasks primarily concentrated in the areas of maneuver, mobility, and survivability. Early review of the results indicated that those brigade elements that used SIMITAR products and training strategies clearly outperformed those elements that did not. Even better results were expected from the 116th Cavalry Brigade, since it would train with SIMITAR strategies and devices for a longer period. In both units, however, brigade personnel favored the compressed training schedules and simulation training received. The ability to conduct more training tasks in a shorter timeframe suited units that had difficulty concentrating soldiers for extended periods of time. Access to JANUS, for example, permitted a unit staff to prepare, brief, and execute and operational order in the short period of six hours. SIMITAR appeared to provide more frequent and realistic training opportunities than possible otherwise.⁸¹

The NG welcomed SIMITAR. With fewer opportunities to conduct field training than AC units and budget cuts ensuring further reductions in live training, SIMITAR offered a means to maintain readiness. It also offered a means to overcome the traditional weaknesses of Guard units in training battalion and brigade commanders and staffs. From the NG's perspective SIMITAR could not replace field training, but it did offer training opportunities otherwise unavailable. While critics feared SIMITAR would transform NG units into virtual organizations with minimal battlefield utility, the 116th Cavalry Brigade demonstrated the utility of SIMITAR in the critical arena of gunnery. This unit applied the new training strategies to qualify its tank crews on Tank Table VIII and performed platoon gunnery exercises to the satisfaction of their AC evaluators in a shorter than usual time. Indeed, between 1993 and 1996 the brigade retained a higher overall rate of gunnery qualification than the Enhanced Brigades.⁸²

SIMITAR remained in a developmental state, however. Its thirty-six separate programs all required an assessment by TRADOC to ensure their utility and did not duplicate projects already undertaken by the Army. Within TRADOC, the Armor Center's DTDD conducted the actual assessments. No funds existed

⁷⁷ Information Systems Office, "SIMITAR: Advanced Distributed Simulation," briefing slides, undated.

⁷⁸ Institute for Defense Analysis, "Assessment of SIMITAR: Status Report One (Draft)," briefing slides, December 3, 1996, pp. 15, 27, 19, 21.

⁷⁹ National Guard Bureau Research and Staff Support Office, Fiscal Year 1997 Posture Statement, undated, pp. 21-22, internet source: <http://132.80.130.121/p97b.htm>.

⁸⁰ "SIMITAR," undated, internet source: webster.gard.state.ia.us/simtext.htm; ISO SIMITAR, "ISO Simulation Program Portfolio," undated, internet source: <http://maco.dc.isx.com/iso/similar.html>.

⁸¹ Institute for Defense Analysis, "Assessment of SIMITAR: Status Report One (Draft)," briefing slides, December 3, 1996, pp. 5, 15, 49, 51, 81, 77.

⁸² National Guard Bureau Research and Staff Support Office, Fiscal Year 1997 Posture Statement, undated, pp. 21-22, internet source: <http://132.80.130.121/p97b.htm>; Institute for Defense Analysis, "Assessment of SIMITAR: Status Report One (Draft)," briefing slides, December 3, 1996, pp. 89, 91, 93.

to conduct formal operational tests. Instead these assessments depended upon feedback from Army personnel involved with the development and use of each SIMITAR project. DTDD then reviewed this data and recommended whether the project should be dropped or prepared for Army acquisition.⁸³

The assessment process continued throughout 1996 and 1997. By March 1997, seventeen of SIMITAR's thirty-six programs had been assessed. Based upon these assessments, TRADOC recommended incorporating seven into ongoing Army programs, stopping development on five, and continuing development on five as SIMITAR projects.⁸⁴ During the course of these assessments in 1996, COL Ritter recommended that simulation needs for the Total Army be prioritized and balanced against available funding. Where similar projects existed in SIMITAR and the Army he advocated that the best be selected and the other's resources applied to it.⁸⁵ Such views represented an attempt to ensure that the Army and the NG coordinate their efforts and resources for a single product rather than pursue two separate, unconnected projects.

Training Developments

In addition to supporting future Army training programs, the Armor Center continued to train soldiers for current operations and field assignments. Throughout 1996 Fort Knox sought to maximize usage of its training assets. Indeed the Army's downsizing, budget cuts, and TRADOC's pending reorganization made review of training resources and their use an ongoing mission. The post leadership wanted to keep Fort Knox at the cutting edge of armor training despite reductions in people and money. This effort to achieve training efficiencies simultaneous with providing effective instruction anticipated the basic theme of TRADOC's Warrior XXI plan. It also reflected General Maggart's reengineering efforts.

Training changed in response to the fielding of new technologies. On September 16, 1996 the last 10 M1 Abrams tank retired from active service in a special ceremony at Fort Knox. These tanks had been retained by 2-81 Armor Battalion for training RC soldiers after the AC had retired the M1. The ten tanks would be replaced by ten M1A2s.⁸⁶ However, the M1A1 remained the Army's standard tank. The Armor School also ceased all M1 training, since student input proved insufficient to justify a special course. M1 tank training also dropped from the Tank Commander Certification Course. The curriculum added the M1A2 Tank Commander Certification Course, following validation of its training materials.⁸⁷

M1A2 training continued to evolve. The 16 CAV maintained a new equipment training team of fourteen NCOs at Fort Hood, where the EXFOR trained on the new tank. Indeed, the M1A2 represented the centerpiece of the Army's digitization effort.⁸⁸ At Fort Knox M1A2 training matured from the set-up phase in 1996. Responsibility for this training lay in the 1-81 and 2-81 Armor Battalions of the 1 ATB. These units built the capability to train 300 crewmen per year at an optimum class size of 30 soldiers. The training process included the standard 14-week training cycle given to all 19K soldiers plus an additional week of specialized M1A2 instruction. In 1996 this capability remained underutilized, since few M1A2 tanks had been fielded. Only those crewmen assigned to M1A2-equipped units at Fort Hood, Texas, received this training. The existence of this training, however, represented the Armor Center's preparations to support the tank once it entered full-rate production.⁸⁹

In December 1996 Fort Knox installed the M1A2 Tank Driver Trainer. Its configuration reflected the changes in the driver's compartment of the new tank. It replaced the M1 tank's Driver's Master Panel with a Driver's Integrated Display and added the Driver's Alert Panel and the Driver's Instrument Panel. It also

⁸³ COL Patrick Ritter, ATZK-TD, "Information Paper - Assessment Plan for SIMITAR Projects," memorandum, May 30, 1996.

⁸⁴ DAMO-TRS, "SIMITAR Assessment Matrix," March 14, 1997.

⁸⁵ MAJ Gary A. Harber, ATZK-SA, "Meeting Notes," memorandum for record, June 6, 1996.

⁸⁶ "Last Original M1s Retire From Active Duty," *Armor*, CV, 6 (November-December 1996) 18.

⁸⁷ Armor School, Input for the 1996 Annual Command History, June 9, 1997.

⁸⁸ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996.

⁸⁹ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

featured a Battlefield Override control similar to that found on the M1A2 tank.⁹⁰ This control permitted the driver to override the tank's electronics and directly operate the engine and throttle. It is intended to allow a tank to escape the battlefield should electrical control be lost.⁹¹ In addition to the standard scenario package for tank drivers, the new simulator features two scenarios utilizing the Battlefield Override and six desert scenarios. Only those armor crewmen assigned to Fort Hood will use the driver trainer initially. It familiarizes drivers with the M1A2 controls, compass, and waypoint navigation. For tank drivers, the new controls on the M1A2 added twelve simulator miles or two hours to the standard training requirement.⁹²

Other new equipment fielded at Fort Knox in 1996 included a navigation device. On November 26, 1996, Company A, 3-81 Armor received 15 Enhanced Precision Lightweight Global Positioning System Receivers (E-PLGR), AN/PSN-1(V1). The E-PLGR provides real time precise position, velocity, and multiple stored waypoints. It offers 16-point position and 1/10 microsecond time accuracy in all weather conditions anywhere in the world. In addition, it provides pinpoint accuracy to weapon and electronic warfare systems. It can be calibrated as necessary.⁹³

A series of POI changes also occurred. Among officer courses AOBC shortened from 16 weeks and 2 days to 15 weeks and 2 days.⁹⁴ TRADOC mandated this cut, although the extent of material did not diminish. AOBC remained a training priority and lessons derived from the CTCs found incorporation into its lesson plans.⁹⁵ The Cavalry Leaders Course, SPLC, and the Senior Officers Logistics Management Course all underwent further revision in efforts to provide focused training that balanced instruction against training time and the needs of the field. BMOC was altered to permit junior officers to attend. In response to TRADOC instructions, the Scout Commander's Certification Course and BMOC underwent preparation for distance learning. The administrative data necessary to transform BMOC from a residence course to a distance learning course were submitted to TRADOC on December 16, 1996. The Tank Commander's Certification Course for the M1A1 entered its final year of resident training. The course was converted to the TATS format for distribution for the RC to teach itself.⁹⁶

Efforts to create one standard for the AC and RC resulted in the elimination of several courses specially designed for the RC. These courses paralleled similar instruction offered to the AC. In a one-standard Army these courses became unnecessary. Consequently, the RC version of AOBC and the NG version of AOAC were dropped. An RC version of AOAC still existed, but in response to guidance from the Army Chief of Staff, it began to resemble the more stringent standards and requirements of the AC version. Previously, RC personnel received the same credit as AC officers, despite the greater length and intensity of the AC course.⁹⁷

Enlisted training benefited from the continued evolution of 1 ATB's soldierization process throughout 1996. This process transformed new recruits into soldiers and constituted the brigade's primary role. This initial entry training (IET) occurred through either one station unit training (OSUT) or basic combat training (BCT) followed by advanced individual training (AIT). IET readied recruits for their first unit assignment. While TRADOC determined training standards, 1 ATB chose the method of attaining them. The soldierization process immersed recruits in a constructive military environment that taught them a new way of thinking and acting based upon teamwork, loyalty, commitment, and a positive attitude. Drill sergeants focused upon building their esteem and confidence, performing the roles of instructors,

⁹⁰ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

⁹¹ Headquarters, Department of the Army, TM 9-2350-288-10-2:Operator's Manual: Unusual Conditions, Troubleshooting, and Maintenance: Tank, Combat, Full-Track: 120-mm Gun, M1A2 (2350-01-328-5964) General Abrams, Vol. 2, February 1995, p. 2-884.

⁹² 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

⁹³ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

⁹⁴ Armor School, Input for the 1996 Annual Command History, June 9, 1997.

⁹⁵ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996.

⁹⁶ Armor School, Input for the 1996 Annual Command History, June 9, 1997; 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996.

⁹⁷ COL Gregory Eckert, "Officer Training," briefing given during 1997 Armor Conference, June 5, 1997; Armor School, Input for the 1996 Annual Command History, June 9, 1997; 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996.

mentors, and coaches. Stress management received considerable attention throughout the process. Trainees were paired to ensure immediate peer support. The instructors supported each other, watching for the signs of stress that could impair training. After action reviews followed each training cycle, ensuring that the soldierization process continued to respond to recruit and instructor needs. The entire soldierization process ensured the continuation of 1 ATB's training effectiveness and prevented abuse of authority by instructors.⁹⁸

Enlisted training also benefited from two POI reviews held by the 1 ATB. In May battalion commanders proposed changes to training. Their recommendations included 1255 lesson plans and generated over 750 proposed POI changes. The number of recommendations indicated a major upgrade of training. A special POI committee reviewed these proposals. Fort Knox implemented those changes concerning armor crewman and scout training. Modifications to BCT, however, had to be referred to the Infantry Center for a final decision. The overall impact of the POI review lay in a series of new lesson plans for armor crewman and scout courses, introduced in pilot form during summer training cycles. These changes included GPS navigation, increased M16 training for tank crewmen, greater use of MILES, more training with indirect fire simulators, and a higher proficiency requirement in the Tank Driver simulators.⁹⁹

By October all except 13 proposals had been addressed and enacted where appropriate. A second POI review occurred in November to discuss the unresolved issues. In addition the battalion commanders submitted 65 more proposals. Principal issues addressed included modifications to the Excellence in Armor standards, tank gunnery skills testing, and the involvement of the DCG and the post support organizations in training. These proposals, however, remained under review by the POI committee at year's end.¹⁰⁰

TRADOC recognized the efforts of the 1 ATB. The 1-81 AR received several awards during the year. Joe Edmunson of B Company received the Instructor of the Year Award. SSG Kevin Greene of F Company was selected as TRADOC Drill Sergeant of the Year. The HHC won the TRADOC Chief of Staff of the Army Award for Maintenance of Excellence Post Level and the TRADOC Level Army Award for Maintenance of Excellence.¹⁰¹

Within the NCO Academy, BNCOC consolidated from five academies into one. This change increased the number of prospective NCOs coming to Fort Knox for training. The consolidation saved money and permitted the NCOA to run up to ten BNCO courses at once. Revision of ANCOC and BNCOC for armor crewmen and cavalry scouts also occurred. BNCOC was restructured to permit rapid accommodation of new doctrine reflecting the Army's adjustment to a power projection force. ANCOC revisions focused upon creating a new task list to be taught. Feedback from AC and RC units fed this list. The ANCOC revisions also prepared the course for conversion to a TATS format. This project remained uncompleted at year's end, pending the receipt of additional funds from TRADOC.¹⁰²

These changes to Armor School curricula occurred amid a series of organizational changes. In the 1st ATB, the 2-13 Armor Battalion was reflagged as the 2-81 Armor Battalion. This action followed the Army Chief of Staff's June 16, 1995 reflagging announcement and the withdrawal of the 13th Armor from TRADOC. At Fort Knox the 2-13 AR inactivated on January 15, 1996 to be replaced by the 2-81 AR. This reorganization marked the first reconstitution of the 81 Armor since World War II.¹⁰³ Within the 1-46 Infantry Battalion, Company B inactivated on April 2, 1996. As a result the battalion shrank from five to four Basic Combat Training Companies. Company B's commander received an assignment to the University of Louisville's ROTC program. In the 2-46 Infantry Battalion, Company E inactivated on March 7, 1996. The 1 ATB's Headquarters and Service Company relocated from Building 5923 to Building 5936

⁹⁸ LTC Eugene J. Palka and COL Fred A. Treyz III, "Fielding the Armor Force of Tomorrow: Soldierization in the 1st Armor Training Brigade at Fort Knox," *Armor*, CVI, 1 (January-February 1997) 44-47.

⁹⁹ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

¹⁰⁰ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

¹⁰¹ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

¹⁰² NCOA, Input for the 1996 Annual Command History, June 23, 1997.

¹⁰³ BG John W. Mountcastle, DAMH-FPO (870-5a), "Regimental Re-flagging," memorandum, July 20, 1995; 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

and became the Headquarters and Headquarters Company. The name change reflected the warfighting spirit that the brigade routinely instilled in the soldiers it trained.¹⁰⁴ Against these inactivations, the 1 ATB gained the 46th AG BN. TRADOC transferred the unit from the Armor Center to the brigade effective October 2, 1996.¹⁰⁵

The 16 CAV's 4th Squadron also prepared for inactivation. The squadron bore responsibility for implementing POI changes for the officer courses. Following the DCG's guidance, it focused upon reviewing OOTW missions for lessons to include in POIs. The declining student load of the Armor Center, however, did not justify maintaining the 4/16 CAV. The regiment's three remaining squadrons absorbed its personnel and mission.¹⁰⁶

Providing sustainment training for the instructing cadres of 16 CAV and 1 ATB proved more difficult in 1996. The heavy workload of the cadres reduced their opportunities to train. Moreover, the Army's budget reductions reduced the funds available for these activities. The post's full training schedule during the weekdays made the weekends an optimum time for instructing personnel to practice gunnery. The high cost of range personnel overtime, however, made this option unrealizable. Despite their training responsibilities, the instructing cadres found little time for sustainment training.¹⁰⁷ Figure 4.7 shows the OPTEMPO of the 16 CAV cadre in 1996, providing an indication of the extent of activities that involved the cadre.

Figure 4.7: 16 CAV Vehicle OPTEMPO¹⁰⁸

16 CAV Element	M1A1 Tank	120-mm	Light Wheeled Vehicle
	<i>Average</i>	<i>120-mm</i>	<i>Average</i>
	<i>Mileage</i>	<i>Rounds Fired</i>	<i>Mileage</i>
A Troop	840	13	3602
B Troop	290	46	2764
C Troop	0	0	2710
D Troop	0	0	2309
E Troop	421	283	2872
HHT	0	0	23
Squadron	550	116	119
TRADOC Average Mileage	355	N/A	1835
DA Average Mileage	554	N/A	1005

Ranges and Training Facilities

Fort Knox's ability to train soldiers depended upon the availability and status of its ranges and training areas. The post possessed 74.9 square miles (47,994 acres) of training space of which 48.6 square miles (31,089 acres) could support mounted maneuver.¹⁰⁹ Although other posts contain more maneuver area—Fort Bliss, for example, includes 1,100,000 acres—many of them suffered environmental restrictions that reduced the training space actually available for training. The existence of endangered species such as the Long Nosed Bat on Fort Bliss and the Black Capped Vireo and Red Cheek Warbler at Fort Hood reduced the attractiveness and utility of these larger posts to units. The absence of environmental

¹⁰⁴ 1 ATB, Input for 1996 Annual Command History, May 20, 1997.

¹⁰⁵ COL John A. Fulmer, "Permanent Orders 46-1," Orders, February 15, 1996.

¹⁰⁶ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996; DRM, Input for 1996 Annual Command History, April 25, 1997, p.5.

¹⁰⁷ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996.

¹⁰⁸ 16 CAV, In-briefing of MG General George H. Harmeyer, notes and slides, November 5, 1996.

¹⁰⁹ Fort Knox Range Control, "Training Areas," undated, internet source: <http://147.238.100.101/center/g3/range/rnglist.htm>.

restrictions and the accessibility of Fort Knox's entire maneuver area helped to ensure the post's ability to draw units for training. The simultaneous accessibility of the VTP only heightened this attractiveness.¹¹⁰

Post training facilities supported every branch of the armed forces and civilian law enforcement. In 1996 Armor School instruction brought 22,800 soldiers to these facilities in addition to over 63,000 RC soldiers expected during the year. Test actions and the training of other military and law enforcement personnel accounted for another 45-50,000 people. Numbers in each area are expected to rise.¹¹¹ Figure 4.8 illustrates range usage. The continued upward trend of facility usage encouraged General Maggart to seek additional maneuver space. More room would accommodate the longer ranges and higher mobility of newer weapon systems. His efforts failed, increasing the importance of maximizing the existing range facilities.¹¹²

Figure 4.8: 1996 Range Usage¹¹³

Type of Weapon	Rounds Fired
Tank main gun	42,610
M16 Semiautomatic Rifle	4,647,256
7.62-mm Machine Gun	2,540,943
Mortar and Artillery	3,864
Hand Grenades	17,621
Mines	2,007
20-mm Cannon	6,962
Hellfire Missile (HE)	73
MICLIC	1
Bradley Main Gun	100,591
Pistol	581,497
.50 Caliber Machine Gun	673,230
40-mm Grenade Launcher	138,156
Demolition (in pounds of explosive)	10,727
2.75-inch rockets	127
30-mm Cannon	15,030
TOW Missile	48
AT-4 AT Missile	146
Nature of Event	Frequency
Total Personnel Using Ranges	549,317
Air MEDEVAC	32
Medical Evacuations on Ground	158
Authorized Entries into Impact Areas	4,468 for 17,178 personnel
Road Marches Conducted	604

Fort Knox's range modernization plan sought to modernize key ranges and increase their efficiency. The plan called for reducing the number of tank ranges from fourteen to six and the number of small arms ranges from forty-one to fifteen. This reduction did not represent a drop in training capacity. Instead, the plan sought reduced operations and maintenance costs by concentrating training in fewer modern facilities capable of continuous operations. Less time would be required to maintain them. The state of the existing ranges encouraged this plan. Some ranges still possessed manual targetry that increased the

¹¹⁰ G3 Range Division, "Range Modernization, Fort Knox, KY," briefing slides, February 20, 1996.

¹¹¹ G3 Range Division, "Range Modernization, Fort Knox, KY," briefing slides, February 20, 1996.

¹¹² Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 13, 1996.

¹¹³ Fort Knox Range Control, "Training Complex Statistics for FY 96," undated, internet source: <http://147.238.100.101/center/g3/range/stats.html>.

time needed to complete training tasks. Others retained old buildings containing asbestos materials, range towers built in the 1940s, poor drainage, or other potential safety hazards. Under the modernization plan ranges capable of supporting Tank Tables VI-VIII received priority. All active ranges, however, would eventually possess automated targetry and scoring. In February 1996 completion of this modernization effort was anticipated in 2001. The schedule remained subject to change, since range projects competed with construction in the cantonment area for the dwindling funding that might be made available.¹¹⁴

The plan also sought to reduce the environmental impact of training activities. Environmental compliance was integrated with the range modernization agenda. The Integrated Training Area Management program ensured the preservation and where necessary the restoration of training lands. This program aimed at minimizing the environmental footprint of military training upon the environment. It included land management actions to recover acreage and temporarily limit activities to allow plots of land a rest period. ITAM accounted for the recovery of 1,445 acres since 1992 of which 1,167 was returned to training use. For 1996 and 1997 a further 800 acres were expected to be recovered.¹¹⁵

Of the six tank ranges planned for future operations, only two had been modernized by the close of 1996. Yano Multi-Purpose Range Complex-Heavy was an entirely new range that entered use in 1993. It could support tank tables V-XII, and it featured state-of-the art targetry. With a computer-generated scoring system and electronic targetry the range epitomized the ideal training facility envisioned by the modernization plan. In 1996 the modernization of Cedar Creek Range completed, and the range entered use in February. The other four ranges included: Steeles, McFarland Oliver, Wilcox, and Baum & St. Vith. Only Baum & St. Vith witnessed actual construction and it was hoped the range area would be operable by March 1997. Baum and St. Vith actually comprised two separate ranges and covered a training area in use since the 1940s. While Baum Range had last been upgraded in 1979, St. Vith became the center of a major modernization due for completion in March 1997. The two ranges will be treated as a single entity for scheduling purposes. Baum Range will be used for stationary gunnery, since its design and manual targetry limit its current utility. The automated targetry and upgraded layout of St. Vith, however, will support Tank Tables VII-VIII.¹¹⁶ The other ranges remained in various states of planning. TRADOC's delay in prioritizing and allocating funds to construction projects meant that further activity upon them would not occur through 1998.¹¹⁷

The range modernization plan also included a site for training mounted forces in military operations on urbanized terrain (MOUT). In the late 1980s MG Thomas H. Tait, USAARMC CG, indicated a need to expose the Mounted Force to urban operations and recommended the creation of a MOUT site at Fort Knox to serve as a testbed for the development of appropriate doctrine. Conceptual development continued into 1990 with preparation of a design for a range facility incorporating long range gunnery, maneuver, complex obstacle breach and an urban combat training site. Known as the Wilcox Project, the priority of this range plan remained low in favor of meeting the immediate needs of the Armor School. By 1993 the project had secured DA support and approval to undertake detailed planning prior to beginning construction in 1996. Between 1993 and 1996, however, the Wilcox Project suffered several delays. Unable to secure funding for all of its range projects, the Armor Center postponed development of the Wilcox Project in favor of modernizing Cedar Creek Tank Gunnery Range. Before the project could be restarted, DA and TRADOC stopped all construction not directly associated with billets and quality of life issues. Reflective of the Army's transition to a CONUS-based projection force requiring increased housing and family support capabilities on military posts, the action derailed planning efforts for the Wilcox Project. The enforced delay in development coupled with the project's high cost resulted in the Armor Center singling out the MOUT site as a separate facility. Now financially more palatable, the MOUT site

¹¹⁴ G3 Range Division, "Range Modernization, Fort Knox, KY," briefing slides, February 20, 1996.

¹¹⁵ G3 Range Division, "Range Modernization, Fort Knox, KY," briefing slides, February 20, 1996.

¹¹⁶ G3 Range Division, "Baum & St. Vith Multi Purpose Training Range (MPTR)," undated, internet source: <http://147.238.100.101/center/g3/range/stvith.html>.

¹¹⁷ G3 Range Division, "Range Modernization, Fort Knox, KY," briefing slides, February 20, 1996.

continued to attract attention at the DA level while the other elements of the Wilcox Project slipped in importance.¹¹⁸

Uncertainty shrouded the MOUT site into 1996. While Congress demonstrated support for the facility, Army range projects generally collapsed through lack of funding. No list of approved Army construction projects emerged to guide planning and development. The intervention of Kentucky legislators, however, prevented the MOUT site from losing visibility and support. Their efforts resulted in the site's inclusion in the Congressional budget and authorization to begin construction the following year. Congress made available thirteen million dollars for the MOUT site in a powerful endorsement of the Armor Center's advocacy for training the Mounted Force in urban operations. Initial plans anticipated construction beginning in June 1997, but no work had started by November.¹¹⁹

Among the training facilities available to Fort Knox, the Patton Museum of Cavalry and Armor remained underutilized and overlooked in 1996. Despite its primary mission of training support, civilian tourists rather than military personnel made the most of the armor heritage and records present. Possessing about 190 vehicles from various nations and time periods the museum represented an important asset in familiarizing new officers and enlisted personnel with tanks and their development. In 1996 this collection added a M113 Armored Personnel Carrier and M4A4 Medium Tank. The vehicle was modified to represent an Armored Cavalry Assault Vehicle and added to the Vietnam War display. The museum also completed its Philippines and National Guard Exhibits and passed its mandatory certification inspection.¹²⁰ Yet classes failed to utilize the museum. Its Abrams Auditorium became more of a banquet and graduation center than a classroom.

Similarly, the Military History Education Program fell into neglect. This program generated no funds, and it required time and personnel resources already stretched. MHEP also collided with a TRADOC trend toward shorter classes that included more subjects. The reshuffling of POIs to ensure a basic skill level for students left little time for MHEP projects. Staff rides, previously a staple of MHEP, became rare. Funding did not exist to prepare and transport soldiers to battlefields. Nor did the professional historical talent exist to support MHEP alone. The Armor Center's first professional historian, Dr. John Cranston, retired in June 1995. His replacement did not arrive until February 1996. His first assignment lay in attending the four-month AOB course, becoming familiar with a key training activity of the post. The Cultural Resource Manager performed the historian responsibilities in the interim, but he deployed to Bosnia in December 1995. He did not return until January 1997. The lack of personnel and funds resulted in an MHEP dead in name only. However, arrival of a new historian, the return of the Cultural Resource Manager, and growing interest on the part of the 1 ATB and 16 CAV made 1997 a potentially more promising year for MHEP.

Godman Airfield continued its modernization efforts throughout 1996. Plans to revitalize the airfield had been implemented in 1994, and Phase I of the project completed in November 1995. In 1996 Phase II completed. It included strengthening and lengthening the runway to 400-feet. The runway was repaved and a heavy cargo ramp built. Ramp aprons, taxiways, and the mid-field aircraft ramp were also resurfaced. Completion of a new drainage system finished Phase II. For 1997 the airfield planned to pave the east end of the ramp, the keyhole parking area and one taxiway. Estimated cost for the entire project was estimated at \$8.875 million. The purpose behind the revitalization lay in permitting heavier cargo aircraft like the C-130 and C-17 to use the runway. Other planes like the C-5A and C-141 would be able to use the runway on a limited basis.¹²¹

¹¹⁸ Dr. Robert S. Cameron, "Fort Knox and Preparation of the Mounted Force for MOUT," Article draft for November-December 1997 issue of *Armor*.

¹¹⁹ Dr. Robert S. Cameron, "Fort Knox and Preparation of the Mounted Force for MOUT," Article draft for November-December 1997 issue of *Armor*.

¹²⁰ John M. Purdy, "96 Museum History," e-mail message, February 10, 1997.

¹²¹ Arthur Smaagaard, "Airfield Modernization," e-mail message, August 8, 1997.

MOS Consolidation

Fort Knox sought to realize training efficiencies through MOS consolidation. Although not widespread, this consolidation affected maintenance training and bore important implications for the M1A2 tank and the nonlinear digital battlefield. The consolidation sought by the Armor Center involved those NCOs who maintained the principal components of the Abrams tank and Bradley Fighting Vehicle. The hull and turret of each vehicle required a specialized mechanic. After several years in the field, these mechanics normally returned to Fort Knox to become reclassified. This reclassification assisted career advancement, but required that a mechanic become qualified in both major component areas of the Abrams tank or BFV. Graduation from Fort Knox's Basic Maintenance Course satisfied this requirement. This course included instruction in both hull and turret maintenance and therefore duplicated the experience of many students. The 1 ATB adopted the unofficial policy of allowing new students to test out of the redundant instruction by passing a hands-on demonstration of their skill. Their training time thus focused upon the component area with which they were least familiar.¹²²

The success of this policy led the Armor Center to attempt its institutionalization. Instead of separate mechanics for the hull and turret of the Bradley and Abrams, their MOS would be merged into one for each vehicle. Support for this action came from several sources. A need existed to simplify the method of recruiting and assigning maintenance personnel. A survey of field maintenance generated by the 1 ATB revealed that mechanics tended to perform both hull and turret maintenance regardless of their MOS. The Marine Corps had already undertaken this consolidation with good results. Moreover, the M1A2 tank and the newer versions of the BFV represented collections of integrated systems that could not easily be separated into hull and turret categories. The databus technology of the M1A2 was also considered sufficiently complex to justify a single MOS for the vehicle.¹²³

Tactical considerations reinforced Fort Knox's recommendation. General Maggart believed a mechanic trained in all maintenance tasks for a particular vehicle better suited to the nonlinear battlefield of the future. AWE Focused Dispatch demonstrated the need for maintenance in the field during tactical operations. In such an environment a single systems mechanic appeared more effective than a component mechanic, since he could provide maintenance support for the entire platform rather than select portions. Freed from the need to continuously master the digital upgrades for all Bradley and Abrams hulls or turrets, he could focus upon a single platform and fully understand its operation. Furthermore a single systems mechanic reduced the personnel requirements for maintenance operations.¹²⁴

In 1995 MG Jordan endorsed the 1 ATB proposal and recommended a joint study with Aberdeen Proving Grounds. TRADOC approved the recommendation in October 1995 as CEP 222 with \$250,000 allocated to it. From November 1995 through August 1996 Fort Knox and Aberdeen Proving Grounds analyzed the concept. The commanders of both installations received the results of these studies. On August 14, 1996, they agreed to run two pilot classes to train a consolidated MOS, the first to begin in January 1997. Afterward the trainees from each class would remain together and conduct a field test at Fort Carson before a final course of action was taken. Based upon the data obtained, a decision on how to implement the consolidation was expected in December 1997. To accommodate this schedule, TRADOC extended the project through FY 97 and redesignated it CEP 215.¹²⁵

The separate studies undertaken by Aberdeen Proving Grounds and Fort Knox, however, revealed differing views on MOS consolidation. Fort Knox preferred to concentrate all maintenance tasks for a particular vehicle into a single MOS. Aberdeen Proving Grounds preferred to consolidate all Bradley and Abrams turret mechanics into a single MOS. Hull mechanics for both platforms would merge into another

¹²² Jim Jordan, MOS 45/63 Consolidation, briefing notes and slides, February 27, 1996.

¹²³ Jim Jordan, MOS 45/63 Consolidation, briefing notes and slides, February 27, 1996; MG Larry R. Jordan, "Consolidation Within MOS 45 and MOS 63," e-mail message, May 2, 1995.

¹²⁴ COL Fritz Treyz, "MOS Consolidation efforts," e-mail message, October 24, 1995; BG Lon E. Maggart, "MOS Consolidation efforts," e-mail message, October 24, 1995; COL Fritz Treyz, "MOS Consolidation Efforts," e-mail message, October 27, 1995.

¹²⁵ Jim Jordan, MOS 45/63 Consolidation, briefing notes and slides, February 27, 1996.

MOS. Thus a single mechanic would be responsible for the turret configurations of all Bradley and Abrams vehicles and their derivatives. This recommendation appeared far more complex than that suggested by the Armor Center, since a single soldier had to master the electronics and hardware of two entirely different vehicles and their derivatives. This plan was not supported by trends in the field.¹²⁶

Foreign Military Training

In 1996 Project Al-Qurain constituted the largest single block of foreign military training conducted at Fort Knox. The project was part of the \$1.9 billion Kuwaiti modernization initiative for their land forces. In 1994 the Kuwaitis agreed to purchase 218 M1A2 tanks and the related training. Their decision was influenced by the success of Project Sword in which Saudi Arabia purchased American tanks and instruction. The Kuwaitis also requested an instructor checkout program to qualify their students as M1A2 instructors. Fort Knox received the mission of training two groups of twenty-four armor soldiers as instructor cadre. Early in 1996 the Kuwaitis expanded the training package to include maintenance training. Senior officials in the Kuwaiti government had urged this action to ensure that Kuwaiti military personnel could provide their own maintenance support without reliance upon foreigners. This training, however, was not scheduled to begin until June 1997. The associated training program represented at least a \$12.5 million investment for Fort Knox.¹²⁷

Project Al-Qurain's training package required forty-eight Kuwaiti soldiers to attend a thirty-six week armor crewman course followed by an additional eight to seventeen weeks to train as instructors. At the start of 1996 the Kuwaiti students arrived at Fort Knox to receive this training. In preparation the 1 ATB had reactivated C Company, 1-81 AR to assist in training the Kuwaitis. All personnel involved in the Kuwaiti training received special classes on Middle Eastern culture and the history of the Saudi peninsula to avoid problems from cultural misunderstanding.¹²⁸

The program anticipated completion of training by year's end, but the students finished both phases of their instruction ahead of schedule, despite initial problems passing the mandatory language skills test. The rapid completion of the students surprised the instructors, and it resulted in an early closure of the project. C-1-81 AR inactivated on December 15, 1996. The military personnel associated with Project Al-Qurain were redistributed throughout the post. The civilian personnel returned to their original positions or were released from federal service. All equipment except that necessary for the upcoming maintenance training had been returned.¹²⁹

The Foreign Military Sales Training Office bore primary responsibility for managing Project Al-Qurain as it had for Project Sword. With Project Al-Qurain largely complete by the end of 1996, however, the office became the victim of budget cuts within the Armor School. First the FMSTO faced the loss of its budget personnel during DRM's consolidation of all resource management personnel. Budget concerns and the absence of any pending foreign training package led the Armor School to abolish the FMSTO. The office shut down in early 1997. Its personnel were realigned within the Armor School where possible, although no permanent position could be found for its director, Gary Priest. The closure of the office removed the small personnel base with experience in managing major foreign training projects at a time when both Sweden and Turkey showed considerable interest in the M1A2 tank and its related training. While Sweden opted to purchase Germany's Leopard 2 tank, the Turks were expected to purchase the M1A2 within about one year. Such a purchase would require the reconstitution of the FMSTO or a similar

¹²⁶ Jim Jordan, MOS 45/63 Consolidation, briefing notes and slides, February 27, 1996.

¹²⁷ Dr. Robert S. Cameron, Interview with Gary Priest, August 7, 1996; 1 ATB, Overview, briefing slides, undated; 1 ATB, Input for 1996 Annual Command History, May 20, 1997; Dr. James W. Williams, "U.S. Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, p. 4-3.

¹²⁸ Dr. Robert S. Cameron, Interview with Gary Priest, August 7, 1996; 1 ATB, Overview, briefing slides, undated; 1 ATB, Input for 1996 Annual Command History, May 20, 1997; Dr. James W. Williams, "U.S. Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, p. 4-3.

¹²⁹ Foreign Military Sales Training Office, Input for 1996 Annual Command History, undated.

organization. Consequently, among the last acts of the FMSTO leadership was an effort to preserve its records for future use and prevent the complete loss of expertise that it had accumulated.¹³⁰

Other foreign training efforts at Fort Knox suffered from the Army's downsizing. The presence of the 194th Separate Armor Brigade had provided eligible foreign armies the opportunity to have their personnel obtain experience by serving in it. Its deactivation in 1995 eliminated this opportunity. Similarly, the Army's abandonment of the M113 APC in its primary role led to the removal of M113 maintenance training from the Battalion Maintenance Officer Course. This act eliminated another attraction to foreign soldiers. It contradicted the trend of the Air Force and Navy to continuously seek services that could be sold abroad whether the related equipment was currently in American usage or not. Together the loss of the 194th SAB and M113 training contributed to a decrease in the enrollment of foreign military students and an effective loss of one source of income to Fort Knox during its downsizing.¹³¹

However, foreign students continued to train at Fort Knox in 1996 in small numbers as they had always done. The presence of many of these soldiers represented efforts to establish contacts with the U.S. Army and symbolized their parent nation's efforts to cement diplomatic ties with America. While attending armor classes at Fort Knox, these officers were trained to the same standards as American soldiers, although few enforcement measures existed. Nor did the FMSTO possess any means of tracking the effectiveness of those officers trained once they returned to their parent nation. For most foreign soldiers, the value of the training received at Fort Knox depended upon their individual willingness to learn and apply the lessons taught. Figure 4.9 shows the foreign soldiers taught at Fort Knox in 1996.¹³²

Figure 4.9: Foreign Military Training in 1996¹³³

	Soldiers Trained	Nationality	Soldiers Trained
Bahrain	1	Colombia	1
Egypt	25	Taiwan	3
El Salvador	1	Kuwait	48
Ghana	1	Canada	3
Greece	9	Panama	1
Jordan	3	Romania	1
Lebanon	8	Estonia	1
Oman	2	Central Africa	1
Portugal	2		
Saudi Arabia	22	Chile	1
Senegal	4	Botswana	1
Sri Lanka	1	Norway	1
Thailand	11	Hungary	1
Uruguay	6	Niger	1

¹³⁰ Foreign Military Sales Training Office, Input for 1996 Annual Command History, undated.

¹³¹ Dr. Robert S. Cameron, Interview with Gary Priest, August 7, 1996.

¹³² Dr. Robert S. Cameron, Interview with Gary Priest, August 7, 1996.

¹³³ Armor School, Input for the 1996 Annual Command History, June 9, 1997.

CHAPTER 5 SYNOPSIS

This chapter outlines principal doctrinal developments within the Armor Center. It links doctrinal projects with the views of General Maggart and the broader needs of the Army. This chapter also addresses the creation of the Directorate of Training and Doctrine Development. While it references the EXFOR activities, a more detailed discussion of the EXFOR and Fort Knox's role in the Task Force XXI Advanced Warfighting Experiment will be included in the 1997 Annual Command History.

Chapter 5: Doctrinal Development

In 1996 doctrinal development reflected the Army's evolution into the Information Age. The collapse of the Soviet Union provided the United States with a global strategic advantage and considerable freedom of action in reshaping its military forces. The Army faced no major threat capable of shaping its force structure, matériel development, or method of fighting as the Soviet Army had done. Budget restraints, however, limited this freedom of action to the conceptual realm. TRADOC PAM 525-5: Force XXI Operations, 1994, provided a basis for the new doctrinal environment. This pamphlet considered change a constant influence upon military developments, reflecting the turbulent world of the 1990s and the potential impact of new technology. The Army reacted by embracing a broader mission spectrum. It sought to sustain its readiness to perform these missions momentarily anywhere in the world simultaneous with preparing for the Information Age. To meet this challenge of maintaining current readiness while digitizing the Army, TRADOC PAM 525-5 advocated constant evolution and self-assessment by the Army. The Advanced Warfighting Experiments of 1994-1995 comprised part of this continuous process. They provided insights into the ability to manage change on the battlefield that in turn fueled changes in doctrine and influenced matériel development. The lessons indicated the Army's needs to conduct digital operations. To meet the overlapping needs of current and future forces, the Armor Center consolidated its doctrinal development activities into one organization: the Directorate of Training and Doctrine Development.

Creation of Directorate of Training and Doctrine Development

Decentralization characterized doctrinal development at the Armor Center immediately prior to 1996. The Mounted Battlespace Battle Lab, 16th CAV, Directorate of Force Developments, Advanced Warfighting Working Group, the Armor School, and the NCOA shared this responsibility. Doctrinal development, however, suffered from the small number of doctrinal experts scattered throughout these organizations. Moreover the training development function tended to be neglected.¹ This decentralization had only occurred in 1993 during a reorganization of the Armor Center.² Through the 1980s the Armor School consolidated this doctrine development in its Command and Staff Department.

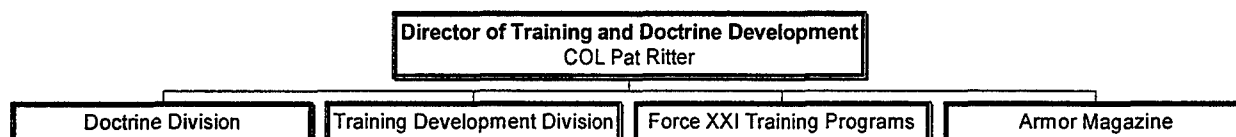
To address more effectively immediate and future training needs, the Armor Center created the Directorate of Training and Doctrine Development in April 1996, following guidance of General Maggart. Colonel Patrick Ritter became its first director, reporting directly to the DCG. The new organization provided the organizational and functional focus necessary to connect doctrine and training development with traditional and emerging missions and capabilities. In particular the Army's adoption of digital technology mandated significant changes to current tactics, techniques, and procedures. These changes required a focus not possible under the previous organization. While DTDD would continue to coordinate its doctrinal and training efforts with other post organizations, it bore primary responsibility for all doctrinal and training products.³ Figure 5.1 shows its structure.

¹ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, October 11, 1996.

² DFD, Input for the 1996 Annual Command History, Science, Technology, and Programs Division.

³ MG Lon E. Maggart, "Directorate of Training and Doctrine Development," briefing slide in presentation entitled "Fort Knox Briefings for General Reimer, CSA," July 1996; DTDD, "Directorate of Training and Doctrine Development Brief for MG George H. Harmeyer," Slides 2-3, December 9, 1996.

Figure 5.1: Directorate of Training and Doctrine Development



DTDD's creation coincided with General Maggart's efforts to reengineer the post for greater business efficiency. This reengineering stressed the importance of consolidating functions within one organization. DTDD consolidated the doctrine and training development functions, and its creation served the military needs of the Mounted Force and the reengineering emphasis of General Maggart. The new organization quickly became integrated into the TAQ process, and a QWB was formed on October 3. A second QWB formed in November to confirm the adequacy of products developed and recommend methods of improvement.⁴ However, the principal reason for DTDD's formation lay in correcting a perceived deficiency in the ability of the Armor Center to support the needs of the Armor Branch.

DTDD's headquarters established itself in Building 1109, the Training Division in Building 2369, the Doctrine Division in 2010 and 2426, and Armor Magazine remained in Building 4401. The physical dispersion of DTDD was not seen as a significant impairment to the directorate's activities. By June personnel staffing to DTDD had been completed through the assignment of experts from the multiple organizations that previously performed doctrine and training development activities.⁵ The directorate comprised 15 officers, 26 enlisted personnel, and 50 civilians. A shortfall existed among branch-qualified officers with field experience who could participate in the development and writing of doctrine. DTDD

⁴ DTDD, "Directorate of Training and Doctrine Development," slides from in-briefing of MG George H. Harmeyer, November 25, 1996.

⁵ DTDD, Input for 1996 Annual Command History, January 7, 1996, p. 1.

possessed only 40% of its authorized officers. Although overstrength in civilian assignments, this surplus could only partially replace the expertise represented by Armor and Cavalry officers, especially since most of these civilians focused upon multimedia applications.⁶

DTDD received a charter developed under DCG Melton's supervision. The charter made DTDD formally responsible for leading the Army in all Armor and Cavalry doctrine and training development. It evaluated courses and prepared training plans for new equipment such as the M1A2 and C2V. For the latter it completed a system training plan. It assumed the management of the Force XXI Training Program and Armor magazine. DTDD also became responsible for teaching organizations how to develop POIs and lessons; a mission previously conducted outside Fort Knox. DTDD assumed responsibility for assessing the projects associated with SIMITAR. TRADOC tasked the Armor Center with this project in 1994, but little action had occurred. DTDD now performed this role in addition to providing quality control for all Armor training. Designing training strategies to support new training devices like the CCTT fell within DTDD's jurisdiction. Its personnel operated the new devices to understand their operation before creating supporting training plans.⁷

The directorate ~~oversees~~ the application of multimedia technologies to training. It played a key role in converting BMOC from a residential course to an exportable class via CD-ROM. It conducted video teletraining, including an instructor training course taught simultaneously at Forts Knox and Leonard Wood. Its Campaign 2001 sought new ways to utilize technology to save money in training. Under this plan DTDD identified tasks viable for conversion to multimedia training and prepared for their conversion. It also identified training tasks to be converted into the TATS format. DTDD's study of ways to change the instruction of AOAC led to plans to convert AOAC into a course conducted via internet chat lines, take-home packages, and video teletraining. Its central role in training development permitted it to complete a plan for the operation of Classroom XXI and circulate it for feedback. Similarly, DTDD developed the Instructor Certification Program for use with the Total Army School System.⁸

In effect DTDD undertook the determination of how all training tasks and courses could be modified through multimedia technology. This effort represented an ongoing process expected to evolve in response to the Army's needs, available funds, and increasing familiarity with digital operations. While the Army sought to utilize technology to revolutionize combat operations, DTDD similarly directed efforts to revolutionize training through multimedia technology. The Force XXI Training Program symbolized this trend and served as a critical link between the tactical lessons learned during the AWEs, new digital equipment, and institutional training strategies. DTDD's proponentcy for it underscored the central role the organization began to play in shaping Army training and the Army itself.

Digitization of Doctrine

Budget constraints impacted the production of training literature. Army efforts to reduce operating costs targeted the publication of printed material. Rising printing costs coupled with a government-wide attempt to reduce paper consumption led to increased use of electronic staffing for the compilation of training literature. TRADOC specifically requested the reduction of all training manuals by 20%.⁹ Electronic writing, staffing, and dissemination of training literature was expected to save money, reduce

⁶ DTDD, "Directorate of Training and Doctrine Development," Slides from in-briefing of MG George H. Harmeyer, November 25, 1996.

⁷ DTDD, "Directorate of Training and Doctrine Development," notes and slides from in-briefing of MG George H. Harmeyer, November 25, 1996; DTDD, Input for 1996 Annual Command History, January 7, 1996.

⁸ DTDD, "Directorate of Training and Doctrine Development," notes and slides from in-briefing of MG George H. Harmeyer, November 25, 1996; DTDD, Input for 1996 Annual Command History, January 7, 1996.

⁹ DTDD, "Directorate of Training and Doctrine Development," Notes from in-briefing of MG George H. Harmeyer, November 25, 1996.

paper costs, and exploit the internet technology available.¹⁰ Consequently, 1996 witnessed an increase in the number of doctrinal manuals going on-line. These manuals could be accessed through any internet connection. This accessibility raised security concerns but the efficiency associated with digitized doctrine outweighed the potential risk.

The Armor Center embraced digitized training literature and electronic staffing. It developed the Internet Information Services Management System to streamline and enhance the development and distribution of new doctrine. This system represented an effort to leverage the information accessibility and distribution capability of the internet for doctrine development. It attempted to place all training literature relevant to the Mounted Force in one user-friendly internet accessible location. This site would include all current and emerging doctrine. It could be searched, read, and/or downloaded depending on the user's needs. However, this project duplicated similar efforts by the Center for Army Lessons Learned to digitize doctrine for the entire Army.¹¹

The Internet Information Services Management System permitted faster dissemination of new doctrine throughout the Army for review. It allowed rapid incorporation of feedback into doctrinal products. While DTDD developed and tested new concepts in the Battle Lab and Mounted Warfare Simulation Center, Entelechy, Inc. digitized doctrinal products and maintained a doctrine web site. Headed by an ex-armor captain, this company received a contract from Fort Knox on October 1, 1995 to develop the Internet Information Services Management System. It maintained an office in Radcliff, KY, for liaison. Some initial problems existed with the user-interface, but these were expected to be addressed as the project was refined.¹²

This Internet Information Services Management System placed manuals on-line and ensured easy access and use. In 1996 it opened the Fort Knox Doctrine Home Page. It also distributed draft versions of the MTPs for tank and scout platoons throughout the Army for download and comment. These comments were then collected and incorporated into the MTPS before DA authorization to publish was sought. The same process applied to publication of FM 17-15.¹³ ARTEP 71-3 MTP (Initial Draft) Mission Training Plan for the Heavy Brigade Command Group and Staff was also distributed via the internet.¹⁴ To end the process of publishing multiple changes to training literature, the Automated Systems Approach to Training Integration provided for automatic updates to doctrine and task training.¹⁵

Entelechy's doctrinal projects included "Issues in Armor." This project represented another means of obtaining and presenting feedback related to Armor and Cavalry developments. Each issue of Armor magazine generated considerable comment from a readership that included a large number of serving and retired soldiers. Space limitations prevented these comments from inclusion in Armor magazine. "Issues in Armor" consolidated them and presented the discussion streams on-line alongside the article that generated the feedback. In 1996 "Issues in Armor" made its debut with a discussion of IVIS and its impact upon command and control.¹⁶

¹⁰ MG Lon E. Maggart, "Mounted Doctrine Initiatives," briefing slide in presentation entitled "Fort Knox Briefings for General Reimer, CSA," July 1996.

¹¹ Fort Knox Doctrine Home Page, "Mission and Function," Internet source: <http://www.entelechy-inc.com/docs/knoxdoc/missfunc.htm>.

¹² DTDD, "Directorate of Training and Doctrine Development," notes and slides from in-briefing of MG George H. Harmeyer, November 25, 1996; Fort Knox Doctrine Home Page, "Mission and Function," Internet source: <http://www.entelechy-inc.com/docs/knoxdoc/missfunc.htm>; Frank Flavell, "Entelechy Contract," E-mail message to Dr. Robert S. Cameron, September 24, 1997.

¹³ "The Tank and Scout Platoon MTPs," Armor, CV, 2 (March-April 1996) back cover.

¹⁴ "Comments on the (Draft) Brigade MTP," Armor, CV, 4 (July-August 1996) 50.

¹⁵ DTDD, "Directorate of Training and Doctrine Development," notes and slides from in-briefing of MG George H. Harmeyer, November 25, 1996.

¹⁶ "The Armor Home Page," Armor, CV, 1 (January-February 1996) 12; "Armor and AOAC Are Going on the Internet," Armor, CV, 3 (May-June 1996) 42.

Doctrinal Overview

The consolidation of doctrinal development activities in DTDD occurred at a critical juncture. The Army faced a three-tiered challenge. Soldiers had to be prepared for immediate deployments and operations with the equipment at hand. However, the Army's transition efforts toward digital operations required doctrine geared to a mixed digital and conventional capabilities force. Army planners, however, looked forward to a fully digitized army with the Army After Next, requiring the continuous development of supporting doctrine. In effect the army of today, tomorrow, and the future required separate doctrines that had to retain a degree of compatibility. Requirements for joint and allied operations further complicated the Army's doctrinal challenge. Moreover, the uncertain nature of the future threat resulted in an expectation that the Army must prepare to operate across the mission spectrum at any time or place. While Cold War doctrine focused upon defeating a known enemy in one geographical area, the post-Cold War era offered no such focus. Versatility would have to characterize doctrine.

To meet this doctrinal challenge DTDD pursued an intense activity pace in its first year operation. In 1996 alone the Directorate published five key manuals.¹⁷ It became the principal tool for General Maggart to determine how the Mounted Force would help prepare Force XXI for the future battlefield. In particular General Maggart emphasized the role of technology as crucial to developing effective doctrine that would remove the lethargy he believed characterized the Armor Branch. He also considered DTDD essential because it preserved a training development function fast disappearing and concentrated doctrinal development in one organization. More timely and effective products could be expected.¹⁸

DTDD sought to incorporate the latest lessons learned into new doctrine and training products. In the absence of a major conflict involving the Army since the Gulf War, DTDD looked to the Combat Training Centers to provide this input. An officer went to the NTC for one month to obtain ideas and comments from the observer/controllers there. This information then fed the doctrine writers. Other DTDD personnel also visited Bosnia and the EXFOR's training at Fort Hood to collect information. Between April and November, DTDD observers spent 2040 man-hours in the field gathering data. COL Ritter also sought the appointment of captains from the CTCs to DTDD to act as doctrine writers. He believed that soldiers should first encounter new developments in training rather than in combat. His efforts sought to minimize the chances of US Armor or Cavalry soldiers encountering unpleasant surprises when they entered the battlefield.¹⁹

Technological advances in weapons and communications underscored the importance of combined arms actions. Advances in lethality guaranteed that no single arm could dominate the battlefield by itself. In the 1920s and 1930s each branch pursued its own doctrinal goals, expecting that cohesion on the battlefield would occur by default if each arm simply followed its own exclusive TTP. In the 1990s, the Army's reduced size and budget, and the importance attached to winning the first battle in any future conflict, created pressure for doctrine to promote combined arms operations. This pressure reinforced General Maggart's emphasis upon the importance of combined arms doctrine. He believed that it had been neglected by the Army and that no mechanism existed to develop and practice it.²⁰ At Fort Knox DTDD monitored doctrinal and training developments throughout the Army. It reviewed 31 field manuals produced by other schools in 1996 to ensure that they addressed integrated actions with armor and cavalry. It also followed General Maggart's guidance in participating in the development of combined arms training strategy intended to link the combat arms throughout the training process.²¹

¹⁷ DTDD, "Directorate of Training and Doctrine Development," notes and slides from in-briefing of MG George H. Harmeyer, November 25, 1996.

¹⁸ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, October 11, 1996.

¹⁹ DTDD, "Directorate of Training and Doctrine Development," notes and slides from in-briefing of MG George H. Harmeyer, November 25, 1996.

²⁰ Dr. James W. Williams, Transcript of interview with MG Lon E. Maggart, December 5, 1995, pp. 12-13.

²¹ DTDD, Input for 1996 Annual Command History, January 7, 1997, p. 14; DTDD, "Directorate of Training and Doctrine Development," notes and slides from in-briefing of MG George H. Harmeyer, November 25, 1996.

To assess the relevance of training and doctrine products once published DTDD implemented the Computer Assisted Survey Program. This program entailed disseminating a questionnaire via the internet to Armor and Cavalry soldiers. It replaced a similar process accomplished through mail-in surveys. In both cases the purpose lay in identifying training needs. Doctrine development could then be matched to these needs as it emerged. The advantage of the Computer Assisted Survey Program lay in the ease of completing the survey and a faster turnaround time for the results to reach the doctrine writer.²²

The Army's efforts to reduce its environmental footprint impacted upon the creation of new doctrine and training literature. DTDD served as a member of TRADOC's environmental workgroup. This group integrated environmental issues into the mission training plans (MTP) for Armor, Cavalry, and the Heavy Brigade command group and staff. It also ensured that environmental issues became an integral part of all training and training development.²³ As a result the manuals were modified to include comments on land use and how to prevent its destruction. TRADOC directed this action and provided the funding necessary to modify the manuals.²⁴

Doctrine development for digital operations focused upon building a solid foundation for the EXFOR to use in the upcoming TF XXI AWE. Scheduled for March 1997, this AWE would test a variety of digital equipment and assess the operation of digital task force at the NTC. The EXFOR comprised elements of the 4th ID at Fort Hood, Texas. Organized and trained for digital operations, the EXFOR represented a tactical laboratory for tactical, organizational, and matériel concerns. The basis for EXFOR doctrine was represented in three publications produced by the Armor Center in 1995: ST 71-1-1, Tactics, Techniques, and Procedures for the Digitized Company Team; ST 71-2-2 (Revised Draft), Tactics, Techniques, and Procedures for the Digitized Battalion Task Force; and ST 71-3, Tactics, Techniques, and Procedures for the Digitized Brigade. These three texts provided guidance on the operation of digital platoons through brigades. They incorporated emerging lessons from AWE Desert Hammer VI and Focused Dispatch. They addressed the promise and realities of existing systems, particularly the gaps in capabilities between different generations of software and systems. ST 71-3 reflected the unconstrained vision of a future digital force that, while technologically feasible, was not in the near term budgetary reach of the Army. However, the three texts provided an initial step toward fighting with digital equipment. They gave the EXFOR necessary guidance for incorporation into training. Further support for the EXFOR came from experience acquired during Focused Dispatch on scenario design and the value of linking the Janus and SIMNET facilities. Future digital doctrine would build upon the first digital texts and reflect the lessons learned from the EXFOR experience.²⁵ However, information from the EXFOR experience would not be incorporated into manuals until the completion of the AWE and its AAR process.²⁶ This decision was an attempt to prevent training irregularities or the peculiarities of prototype equipment from shaping future doctrinal development.

While the Armor Center continued to support EXFOR activities in 1996, it focused considerable effort upon meeting the current Mounted Force needs. Training and doctrinal literature required updating to reflect the changing missions and battlefield environments soldiers could expect to face. General Maggart's interest in Cavalry development helped complete efforts to update and publish FM 17-95: Cavalry Operations. Armor training benefited from the publication of FM 17-15: Tank Platoon. Both manuals reflected significant changes over their predecessors and demonstrated Armor Center willingness to secure current needs without sacrificing them in the interest of future concepts and matériel yet to be developed. Soldiers tagged for overseas deployments still required the ability to operate with non-digital means on a conventional battlefield.

²² DTDD, Input for 1996 Annual Command History, January 7, 1997, p. 11.

²³ DTDD, Input for 1996 Annual Command History, January 7, 1997.

²⁴ DTDD, "Directorate of Training and Doctrine Development," notes and slides from in-briefing of MG George H. Harmeyer, November 25, 1996.

²⁵ Dr. James W. Williams, "U.S. Army Armor Center and Fort Knox 1995 Annual Command History," June 3, 1997, pp. 2A17 through 2A18. Chapter 2A outlines the trends and developments in digital doctrine in 1995.

²⁶ DTDD, "Directorate of Training and Doctrine Development," notes and slides from in-briefing of MG George H. Harmeyer, November 25, 1996.

Cavalry Doctrine

With the establishment of a doctrinal baseline for digital operations, General Maggart's focus shifted to Cavalry operations. He expressed concern over the future role of Cavalry, and he wanted to ensure its full incorporation into Force XXI and a clear role on the digital battlefield. This goal included the conceptualization of Cavalry operations, not simply providing improved matériel for Cavalry units. He expected changes to occur in the conduct of cavalry missions that would force changes in the thought processes of commanders. To ensure that these changes received proper attention, he spent considerable energy developing his vision for Cavalry and publicizing it.²⁷ Throughout 1996 Cavalry training and doctrinal literature received considerable emphasis to prepare Cavalry units for digital operations and to ensure that they stayed abreast of changing conditions in the world that could easily influence the battlefield of current forces and those of Force XXI. Figure 5.2 indicates principal Cavalry training and doctrinal products developed in 1996.

Figure 5.2: Major Cavalry Products in 1996

PRODUCT	STATUS
FKSM 17-96: (Initial Draft) Digitized Cavalry Squadron	Completed
FM 17-97-10: (Initial Draft) Brigade Reconnaissance Troop	Completed
FM 17-95: Cavalry Operations	Published
Cavalry VTC--26 August 1996	Completed
ARTEP 17-57-10-MTP: Scout Platoon MTP	Completed
FM 17-12-8: (Outline) Light Cavalry Combat Tables	Ongoing
Cavalry Symposium	Completed
Reconnaissance Symposium	Completed
Armor Conference Cavalry Panel	Completed
11 articles in Armor Magazine devoted to American Cavalry	Published

Cavalry development at the Armor Center resulted in the crystallization of ideas for future cavalry to support Force XXI. The Armor Center believed a need for a dedicated, specialized Cavalry force would continue into the foreseeable future. Its fundamental roles would remain those of reconnaissance and security. Cavalry would continue to secure information necessary for a tactical commander, fill gaps in the intelligence obtained through electronic means, and fight enemy recon elements as necessary. Digitally equipped cavalry could provide rapid updates of enemy activity and possess enhanced situational awareness, but also retain the ability to obtain human intelligence assessments. In its security role, Cavalry would prevent enemy forces from gaining an accurate assessment of friendly units, protect critical support and logistical operations, and permit decisive maneuver forces to operate freely. In these roles, future Cavalry would play a key role in effecting information dominance. Through its actions it was intended to provide the principal maneuver elements freedom of operation and prevent their premature engagement. In the nonlinear environment of the digital battlefield, Cavalry would bear responsibility for creating the conditions for rapid, continuous operations. It would seek the expansion of the battlefield to permit friendly maneuver forces more time and space in which to operate.²⁸ Ensuring that Cavalry forces would be capable of meeting these needs became part of the strategic plan developed under General Maggart's guidance.²⁹

This vision of Cavalry operation derived from a set of assumptions based upon ongoing EXFOR activities and TRADOC studies. These assumptions comprised:

- Reconnaissance and security tasks require specialized units

²⁷ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, October 11, 1996.

²⁸ MG Lon E. Maggart, "Cavalry in Force XXI," *Armor*, CV, 5 (September-October 1996) 11-13.

²⁹ USAARMC, "Salt River Country Strategic Plan," draft, September 10, 1996, p. 21.

- Information collection and force protection means are necessary assets for commanders
- Independent maneuver forces are required to shape the battlespace
- An all-weather and all-terrain human information-gathering capability is required
- An ability to fight for information is required

Clearly the information needs of the future force suggested the importance of Cavalry elements. In addition the Armor Center believed Cavalry units well-suited to support the Force XXI operational concepts. The latter focused upon force projection, force protection, information dominance, shaping the battlespace, decisive operations, sustaining operations, and transitioning to future operations. Cavalry organized as a self-contained combined arms team would be suitable for early entry operations. In all of these areas the main function of Cavalry would remain the support of the decisive force. Cavalry would fulfil this mission through destruction of enemy ground intelligence capabilities, preventing enemy interference with the decisive force, and protecting intelligence and support nodes.³⁰

Cavalry units would require changes in organization and matériel to support Force XXI. In analyzing the type of changes, the Armor Center followed several basic concepts. It believed that cavalry forces had to be organic to all echelons, since all required some recon and security capability on the nonlinear battlefield. Centralized pooling of these assets was not desirable. Because of the great distances cavalry units had to cover in relation to the main force, cavalry units had to be able to maneuver faster than other ground forces. They required greater operational endurance, including the ability to sustain independent operations up to ninety-six hours. They also needed the capability to conduct multiple and simultaneous missions. This capability would allow maximum tactical flexibility and ensure rapid reaction should a peace stability operation erupt into combat.³¹

The Cavalry Symposium

The ideas emerging regarding the future role of Cavalry influenced the Cavalry Symposium held at Fort Knox in February 1996. The Cavalry Symposium provided a forum where ideas regarding the training and operation of cavalry units could be discussed by representatives from the Armor Center, the CTCs, and the field. This event was the first such meeting in eight years. Attendees unanimously opted for more regular sessions that focused on one or two key issues. This interest reflected the pace of changes occurring in the Army as it transitioned toward a digital force.³²

Among the issues addressed in the February symposium was the role of Cavalry in Force XXI. Discussion emphasized the importance of economy of force actions, the unique ability of cavalry to fight for information, the staff needs required to sustain high-tempo, continuous operations, and the value of the human element to Cavalry operations. Consensus also existed regarding the need to elaborate upon the actions of cavalry in pursuit and exploitation operations. These issues mandated greater emphasis in future cavalry training and doctrinal literature.³³

Discussion also focused upon the recon troop of the brigade. The 1995 version of FM 71-3 did not specifically address brigade recon and security forces. Hence the Armor Center was requested to produce a document dealing with the brigade recon troop and the relationship between its activities and those assigned to task force scouts and the divisional cavalry squadron. CTC observations indicated that in planning operations, units failed to integrate reconnaissance and security actions into the orders process. Existing doctrine did not adequately emphasize these actions, despite the importance of

³⁰ MG Lon E. Maggart, "Cavalry in Force XXI," Armor, CV, 5 (September-October 1996) 11-13.

³¹ MG Lon E. Maggart, "Cavalry in Force XXI," Armor, CV, 5 (September-October 1996) 11-13.

³² LTC Robert M. Schmidt, ATSB-SBA, "Cavalry Symposium Executive Summary," memorandum, March 8, 1996, p. 1, Cavalry Symposium Binder.

³³ LTC Robert M. Schmidt, ATSB-SBA, "Cavalry Symposium Executive Summary," memorandum, March 8, 1996, Cavalry Symposium Binder; Cavalry Symposium, "Cavalry in Force XXI," briefing slides, undated, Cavalry Symposium Binder.

situational awareness. Organizationally, recommendations emerged to enhance command and control and ease the process of attaching command support to the brigade reconnaissance troop.³⁴

Divisional cavalry squadrons suffered from inadequate training resources. Responsibility for training the commander and staff of this unit remained unclear. Many divisional cavalry squadrons lacked maneuver space to adequately perform their missions according to doctrine. Their gunnery training suffered from the need to utilize multiple weapons in comparison with most maneuver units, yet they received the same time allocation as other units for gunnery training. In maneuver training, their operations were disrupted by the arbitrary participation of division TACs. Nor did they receive sufficient experience in integrating their actions with those of the divisional air assets. As a partial remedy, the attendees recommended integrated air-ground lane training, but resources made this solution difficult to implement.³⁵

OOTW missions were expected to be a normal deployment into the foreseeable future. The growth of OOTW missions generated a demand for a coordinated series of training and doctrinal literature dedicated to these operations. Other recommendations concerned the provision of rules of engagement training, media relations, training junior leaders in the conduct of joint or multi-national operations, and ensuring the recruitment and retention of high quality soldiers capable of acting responsibly in OOTW.³⁶ These concerns reflected the frustration felt by many officers about the absence of centralized doctrine for OOTW coupled with an increased frequency of such operations.

The particular needs of OOTW and the transitioning the Cavalry toward the future resulted in changes to the 2 ACR. During the Gulf War this unit had won a stunning victory over Iraqi Republican Guard elements at the battle of 73 Easting. This battle had been minutely analyzed, simulated, and recreated as a database for use in SIMNET.³⁷ Since 1991, however, the Army's emphasis upon light, rapidly deployable forces that could be inserted quickly into potential hotspots resulted in the regiment's transformation. Gone were the Abrams tanks and Bradley Fighting Vehicles that had proved decisive at 73 Easting. When the unit deployed to Haiti during Operation Restore Democracy, it was a HMMWV-based force. Its peace stability and enforcement role were considered successful and its rapid deployment capability a potential model. Its principal role in Haiti consisted of providing security to civil-military operations and supporting the UN peacekeeping presence.³⁸ However, questions remained regarding the unit's ability to provide the type of security missions outlined for Force XXI. It appeared to some that the 2 ACR might have sacrificed too much of its lethality in the interest of deployability. In its current configuration the unit did not appear to possess sufficient combat power. One recommended fix assigned a company of M1A1 tanks and a battery of Paladins to each squadron in place of TOW-equipped HMMWVs and M198s.³⁹ The issue of the 2 ACR's role and organization served as a point of discussion during the Cavalry Symposium and highlighted a central unresolved question facing the Cavalry: how should a cavalry unit be organized and equipped to fulfil the broad range of missions assigned?

The concerns indicated at the Cavalry Symposium reflected the transitional state of the Army. While cavalry's role on the 21st Century battlefield seemed guaranteed, and coherent ideas existed about the precise nature of that role, the cavalry faced problems impacting its immediate and near-term readiness. The doctrinal needs of the future and the present did not coincide except in principle. The specific tasks and methods of execution differed, partially because the future vision depended upon matériel either not yet developed or existing only in a prototype state. The immediate reality faced by the field lay in maximizing the effectiveness of the personnel and equipment currently available. The symposium indicated a belief that doctrinal changes and additions could help the achievement of this goal. In addition

³⁴ Cavalry Symposium, "Cavalry in Force XXI," briefing slides, undated, Cavalry Symposium Binder.

³⁵ LTC Robert M. Schmidt, ATSB-SBA, "Cavalry Symposium Executive Summary," memorandum, March 8, 1996, Cavalry Symposium Binder.

³⁶ Cavalry Symposium, "Reconnaissance in Force XXI," briefing slides, undated, Cavalry Symposium Binder.

³⁷ COL Michael D. Krause, "The Battle of 73 Easting; 26 February 1991: A Historical Introduction to a Simulation," Center of Military History & Defense Advanced Research Projects Agency, August 27, 1991.

³⁸ Cavalry Symposium, "2d ACR: "Always Ready," briefing slides, undated, Cavalry Symposium Binder.

³⁹ LTC Kevin C.M. Benson, "Whither the 2d Cavalry," *Armor*, CVI, 1 (January-February 1997) 20-21.

the ongoing discussion regarding future Cavalry operations would guide the doctrinal evolution toward Force XXI.

FM 17-95: Cavalry Operations

A gap existed between the emerging view of Cavalry in Force XXI and its near-term needs. In 1996 the publication of FM 17-95: Cavalry Operations helped to fill this void. Its publication reflected a desire by General Maggart to ensure that Cavalry's role remained clearly defined on today's battlefields as well as those of the next century.⁴⁰ This goal coincided with a more general view that Cavalry doctrine required updating to take into account the changed world situation and the uncertainty surrounding the nature and identity of potential enemies. The manual became a discussion topic at the Cavalry Symposium, benefiting from the analysis of its contents. The doctrine writers received an assessment of the manual directly from the potential users. Their comments were incorporated into the draft manual prior to publication. Overall these comments tended to be favorable, and recommended changes focused upon clarity rather than substance, especially in the areas of air-ground integration, area security operations, and logistical support for the divisional cavalry squadron.⁴¹ The manual's emphasis upon training cavalry leaders how to think through tactical situations received high praise by field commanders.⁴² In fact the final published version reflected a trend in doctrine writing toward user-friendly texts.

FM 17-95: Cavalry Operations described the employment of Cavalry units, focusing upon the separate cavalry regiments and the divisional cavalry squadrons. It established the basic doctrinal principles for cavalry operations. It also served as a guide for corps, division, and brigade commanders and staffs, describing the purpose of cavalry units and the method of their employment. The manual detailed the responsibilities of cavalry commanders, staffs, subordinate troop and company commanders in conducting operations from low-intensity stability missions to high-intensity combat. Intended to meet the immediate needs of Cavalry officers, it focused upon non-digitized operations. A separate appendix offered a general discussion of digital cavalry operations.⁴³

Compared to the earlier 1991 edition, clarity and ease of comprehension characterized the new FM 17-95. It did not include major changes to the principles guiding cavalry employment. Instead, it offered additional information on those topics identified at the Cavalry Symposium. The focus shifted from high-intensity operations against a Soviet-style enemy to a more balanced description of cavalry operations across the mission spectrum. A new section in the introductory chapter underscored this focus. It stressed the importance of preparing cavalry for encounters with a variety of potential enemies in an ever-changing geopolitical environment. Similarly, OOTW had to be reconsidered as a mainstream mission rather than an aberration. Reflective of their growing prevalence, peacekeeping and stability operations received a separate chapter, instead of being briefly addressed in an appendix as an afterthought. In the new edition the appendices elaborated on topics useful to commanders and staff officers. These topics included guidance for developing a squadron or regimental SOP, the importance of rehearsals to the planning process, and training literature.⁴⁴

Appendix B provided an overview of the capabilities and limitations of the digital cavalry operations. It focused upon the divisional cavalry squadron. The appendix emphasized the importance of digital communications as an enhancement to existing principles of employment and operation. Basic methods

⁴⁰ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 13, 1996.

⁴¹ LTC Robert M. Schmidt, ATSB-SBA, "Cavalry Symposium Executive Summary," memorandum, March 8, 1996, Cavalry Symposium Binder; LTC Robert M. Schmidt, "Cavalry Symposium Hotwash," August 3, 1996, internet source: http://www.entelechy-inc.com/cgi-bin/print_hit_bold.pl/docs/knoxdoc/cavaar.htm?combined+ar9/29/97.ning+st.

⁴² Cavalry Symposium, "Contemporary Issues FM 17-95," briefing slides, undated, Cavalry Symposium Binder.

⁴³ Headquarters, Department of the Army, FM 17-95: Cavalry Operations, December 24, 1996.

⁴⁴ Headquarters, Department of the Army, FM 17-95: Cavalry Operations, December 24, 1996, p. 1-8, Chapter 7: Stability and Support Operations, Appendices A through D.

of operation and doctrine remained unchanged. It outlined the pros and cons of current digital equipment, but warned against overreliance upon matériel that had yet to be fully developed. It expected connectivity problems would exist in combined operations with non-digital or allied forces. In describing digital cavalry operations, the appendix reinforced a basic theme of the manual: the success or failure of cavalry operations depended upon the traditional skills of interpreting and acting decisively upon information available in a timely fashion.⁴⁵

The 1991 edition of FM 17-95 included a chapter on command and control. In the 1996 version this chapter became "Battle Command." The name change reflected the greater emphasis within TRADOC upon the development of commanders and staff officers. The chapter offered a clear description of each command echelon and the associated responsibilities. Such familiarization ensured that a new commander or staff officer could readily comprehend the command structure and its operation. The chapter layout and text also ensured that he could not fail to understand the linkage between this structure and the use of intelligence. Acquiring intelligence and incorporating it into all phases of the decision-making process constituted a principal part of the chapter. Not only was this emphasis logical for a force tasked with gathering information from the battlefield, it also helped to remedy the observed failure of commanders of the CTCs to properly use intelligence available to them. A related section discussed the role of automated information systems, specifically describing the concept of FCB2 and MCS/P. It provided an overview of how these systems would fit into the command structure and process. Although it indicated a need for new initiatives to determine how best to exploit this technology, it offered no details as to what direction these initiatives should take. The section served primarily as an indicator of things to come. More immediately relevant information was provided in the chapter's expanded section on air-ground integration that included an example of how such coordination should occur. Not only did such information provide instruction in one aspect of combined arms operations, it also addressed a concern of the Cavalry Symposium.⁴⁶

Reconnaissance and security operations remained critical cavalry missions. The new manual offered no radical departures in principles or procedures. The Armor Center favored reconnaissance actions covering large areas and not exclusively focused upon enemy forces. The terrain and possible avenues of approach received equal attention, since they influenced the main force's ability to outmaneuver an enemy. The broad focus of reconnaissance elements provided maximum information about the battle area. Based upon this information, main force elements maneuvered to exploit weaknesses in the enemy's disposition. In this manner cavalry units shaped the battlespace. Their actions would influence when and where the decisive engagement would occur. This process, known as reconnaissance-pull, fit the vision of Force XXI cavalry operations. It offered the maximum response time and space for a main force commander. The draft version of FM 17-95 included reconnaissance-pull. However, CAC commander LTG Holder favored force-oriented reconnaissance in which recon elements focused upon enemy forces. He did not consider it necessary for recon units to spend the time and effort required to cover an entire area of operations when enemy forces constituted the principal battlefield objective. General Holder's views resulted in FM 17-95 dropping its reconnaissance-pull emphasis in favor of force-orientation. Reconnaissance-pull, however, remained a concept likely to gain increased visibility.⁴⁷

Overall reconnaissance and security in the new manual became less focused upon operations against the Soviet Army. Previous versions included detailed descriptions of how Soviet maneuver forces would deploy and operate before describing the action of American cavalry. These detailed references to a non-existent army disappeared, leaving only the basic principles of operation. These principles could be applied in a variety of environments against most potential threats. The security chapter, however, added

⁴⁵ Headquarters, Department of the Army, FM 17-95: Cavalry Operations, December 24, 1996, Appendix B: Digital Cavalry Operations.

⁴⁶ Headquarters, Department of the Army, FM 17-95: Cavalry Operations, December 24, 1996, Chapter 2: Battle Command; Cavalry Symposium, Cavalry Symposium, "Contemporary Issues FM 17-95," briefing slides, undated, Cavalry Symposium Binder.

⁴⁷ Headquarters, Department of the Army, FM 17-95: Cavalry Operations, December 24, 1996, Chapter 3: Reconnaissance Operations, Chapter 4: Security Operations; Dr. Robert S. Cameron, "FM 17-95," memorandum for record, October 1996.

a section detailing the procedures for convoy escort in regions with the potential for combat. This addition reflected the type of missions already conducted in Bosnia and likely to be required in the future.⁴⁸

A new chapter addressed the role of cavalry in stability and support operations. Previously, this topic had been an appendix. Expanding coverage of OOTW symbolized the increased likelihood of employment on such missions. No longer could they be considered abnormal. Moreover, cavalry commanders and staffs needed specific guidance on how principles developed for a conventional warfighting environment would be applied to OOTW. The manual addressed these concerns and offered special instructions regarding rules of engagement and the importance of intelligence. The acquisition and timely use of intelligence constituted an important feature of all cavalry operations across the mission spectrum.⁴⁹

Another new chapter addressed combined arms operations. It reflected the emphasis of Combined Arms Center Commander LTG Holder and General Maggart upon combined arms operations. Previously this topic tended to be referenced in passing rather than described and illustrated in detail. The chapter sought to promote awareness of combined arms capabilities and the need to synchronize their actions for maximum effect. Integrating the action of air assets with cavalry actions received a major emphasis. This topic especially concerned cavalry units, since they normally operated over great distances and relied in part upon air assets to obtain information. By promoting greater awareness of the need and method of air-ground interaction the chapter also sought to prevent fratricide incidents similar to those experienced in the Gulf War. Finally, this chapter included engineer operations and the need for cavalry units to understand and incorporate engineering assets into their plans. All of these topics reflected the needs of the force and had found partial expression at the Cavalry Symposium.⁵⁰

Reconnaissance Symposium

In October 1996 Fort Knox hosted the Reconnaissance Symposium. Like the earlier Cavalry Symposium, this event brought representatives from field units and Army organizations together to discuss current issues in the realm of reconnaissance and surveillance. Presentations addressed the nature of reconnaissance, its role on the 21st Century battlefield, and critical analysis of recon and surveillance operations actually conducted. The Infantry Center, Army Aviation Center, Army Intelligence Center, and the Marine Corps all provided branch perspectives on reconnaissance operations. The symposium served as a forum for discussion and idea sharing. It promoted awareness of activities and issues throughout the reconnaissance community, and it encouraged open discussion regarding the integration of recon and surveillance systems on the digital battlefield. The participation of British COL S.J.L. Roberts describing the United Kingdom's approach to reconnaissance expanded the discussion beyond the purely American perspective. His presence underscored the growing Anglo-American interest in developing a joint cavalry vehicle.

The Armor Center's DTDD opened the symposium with an overview of reconnaissance doctrine. It established key definitions to distinguish between recon and surveillance. While the latter represented a passive mission of observing a given area, reconnaissance was dynamic. It included information collection regarding terrain, the enemy, and avenues of approach. Critical in this distinction was the emphasis given to human input in recon operations, while automated platforms were expected to perform much of the surveillance mission. DTDD identified several fundamentals of reconnaissance:⁵¹

- maximum reconnaissance forward

⁴⁸ Headquarters, Department of the Army, FM 17-95: Cavalry Operations, December 24, 1996, Chapter 3: Reconnaissance Operations, Chapter 4: Security Operations.

⁴⁹ Headquarters, Department of the Army, FM 17-95: Cavalry Operations, December 24, 1996, Chapter 7: Stability and Support Operations.

⁵⁰ Headquarters, Department of the Army, FM 17-95: Cavalry Operations, December 24, 1996, Chapter 9: Combined Arms Integration; Dr. Robert S. Cameron, "FM 17-95," memorandum for record, October 1996.

⁵¹ DTDD, "Fundamentals of Reconnaissance," Slide 7 of briefing entitled "Reconnaissance 101," October 24, 1996, Reconnaissance Symposium booklet.

- orientation upon the objective
- rapid, accurate reporting of all information
- retention of freedom to maneuver
- gain and maintain enemy contact
- develop the situation

These fundamentals corresponded to concepts included in FM 17-95: Cavalry Operations. They also represented guiding principles for developing the reconnaissance portion of cavalry doctrine for Force XXI.

The symposium reviewed reconnaissance trends using data obtained from the Rand Corporation in 1987 and 1995. In 1987 it noted the absence of timely reconnaissance planning and preparation. Nor did doctrine adequately address recon and counterrecon operations. Scout platoon leaders received no special training, and the recon platforms in use lacked stealth. Between 1987 and 1995 the Armor Center adjusted its training to address these problem areas. It established the Scout Platoon Leader's Course, supported the shift in scout unit equipment from BFVs to HMMWVs, and expanded Cavalry doctrine to provide greater coverage of reconnaissance operations. These remedial actions improved the reconnaissance capability of cavalry units. However, the 1995 Rand study found weaknesses in the planning, preparation, and execution of reconnaissance operations within the BN/TF battle staffs. Scout survivability remained an unsolved problem. The use of HMMWVs as reconnaissance platforms increased stealth but not survivability once discovered. This study led the Armor Center to increase the institutional training time devoted to recon and surveillance techniques. It also began planning a matériel solution to meet reconnaissance needs. This solution was the Future Scout and Cavalry System. Plans for FSCS called for a vehicle carrying an array of advanced technology sensors, enhanced survivability, digital and voice communications capability, self-defense armament, and the ability to operate 72 hours without resupply.⁵²

The Senior Brigade Trainer from the NTC identified existing weaknesses in the conduct of reconnaissance and surveillance operations. The NTC trend toward brigade over battalion-level operations increased the complexity of actions associated with an NTC rotation. Consequently, new problems emerged in recon operations. From the NTC's perspective systemic problems existed throughout the force in recon and surveillance operations. Based upon data taken from unit rotations, a direct correlation existed between effective recon and the success of a unit's operation. Data analysis indicated a 78% chance of mission failure where the preceding reconnaissance effort failed. Superior reconnaissance ability also underscored the winning tendency of the NTC's OPFOR.⁵³

Too often visiting units demonstrated an inability to plan, prepare, and execute reconnaissance missions effectively. Recon operations appeared as an afterthought to the brigade and battalion planning process. Clear objectives and control measures were absent, and a high fratricide rate existed. Combat and service support were not provided to recon elements. Patrolling, probing, and reconnaissance in force were considered nearly extinct skills. Too often ground recon units moved in columns and refused to conduct dismounted actions. The well developed TTPs of cavalry units permitted them to outperform consistently recon assets from armor or mechanized task forces. However, confusion characterized the degree and source of detail to be provided in reconnaissance plans. Once the recon elements began their missions, higher headquarters tended to forget them and did not monitor their actions. Too often recon actions completed failed to obtain useful, timely information. No matter what the outcome the forces involved always suffered excessive casualties.⁵⁴

Addressing these problems required TRADOC action in the form of organizational changes. While awaiting implementation of these corrective measures, the NTC recommended several fixes. Recon actions had to be integrated into all phases of planning and preparation and receive the attention of the commander. Reconnaissance missions were too important to be generated and executed independent of the main effort. Commanders needed to plan their missions in advance, without awaiting the conclusion of

⁵² DTDD, "Reconnaissance 101," briefing slides, October 24, 1996, Reconnaissance Symposium booklet.

⁵³ Senior Brigade Combat Trainer, "National Training Center R&S Trends," briefing slides, undated, Reconnaissance Symposium booklet.

⁵⁴ Senior Brigade Combat Trainer, "National Training Center R&S Trends," briefing slides, undated, Reconnaissance Symposium booklet.

their ongoing operation. Recommendations also focused upon review of the organization and equipment of reconnaissance units. Overall, the NTC considered the observed reconnaissance problems systemic and not simply the result of poor training. Solutions therefore had to address the cause of the problems.⁵⁵

The growing attention given to recon-pull made implementation of these corrective measures vital. Reconnaissance-pull doctrine emphasized the use of recon elements to determine enemy weakpoints and suitable avenues of approach. Based upon the information obtained, main force elements would be committed to exploit uncovered enemy weaknesses via the most suitable route. In this manner the forward recon elements shaped the battle and played a key role in determining when and where the decisive action would occur.⁵⁶ This role could not be performed if their actions were not closely tracked and integrated with those of the main force. Recon-pull also depended upon the ability of recon elements to survive on the battlefield and secure key information in a timely manner.

While the Reconnaissance Symposium did not solve the problems facing the organization and employment of recon units, it did raise their visibility. It provided a forum for representatives from multiple branches with reconnaissance and surveillance interests to exchange views on common problems. This idea-sharing promoted solutions to problems identified. The symposium also underscored the central role of the Armor Center in developing doctrine and institutional training to address problem areas for reconnaissance.

Armor Doctrine

Armor doctrinal accomplishments in 1996 addressed the current needs of tank units rather than potential digital requirements. A doctrinal foundation for armor units had been developed in 1995, but it represented a startpoint for further experimentation. Like cavalry doctrine, armor doctrine needed to address the immediate needs of tank units while digital developments continued to evolve with Force XXI.

Digital doctrine did receive continuous attention because of its relevance to EXFOR activities. Yet although work began on a special text TTP for the digital tank platoon, the project was dropped. Too many changes occurred during the cycle of writing, editing, and publishing for the prospective manual to retain its relevancy. At Fort Hood every sixty days witnessed a significant change in operating procedure. Even with electronic writing and staffing the manual preparation process could not keep pace with events. Moreover, questions remained regarding the impact of digitization upon platoon operations. The most common view believed that digitization would not affect the fundamentals of platoon operations but would enhance their pace and style of execution. Basic tactics would remain unaltered. Digitization did not replace the need for tactical competence; at the platoon level it simply enhanced existing capabilities. For the company/team, battalion/task force, and brigade, Fort Knox had already published interim manuals for use by the EXFOR, but these were considered outdated when received.⁵⁷

The Gulf War demonstrated the need for the Army to be prepared to fight in the desert. Doctrinal interest in desert operations remained high. Following TRADOC guidance, Fort Knox undertook the update FM 90-3: Desert Operations. This manual focused upon mobile operations in a desert environment, incorporating lessons learned from the Gulf War and the experiences of Saudi and Kuwaiti soldiers training on American equipment in their home countries. This project had to be postponed indefinitely, however, due to lack of funding. Although information compiled for the manual was considered valid, the incorporation of this information into existing manuals describing battlefield operations in general reduced the need for a special publication.⁵⁸ As the Army embraced the concept of

⁵⁵ Senior Brigade Combat Trainer, "National Training Center R&S Trends," briefing slides, undated, Reconnaissance Symposium booklet.

⁵⁶ DTDD, "Reconnaissance Pull," Slide 23 of briefing entitled "Reconnaissance 101," October 24, 1996, Reconnaissance Symposium booklet.

⁵⁷ Dr. Robert S. Cameron, "FM 17-15: Tank Platoon, April 1996," memorandum for record, September 26, 1997.

⁵⁸ DTDD, "Directorate of Training and Doctrine Development," briefing of MG George H. Harmeyer, November 25, 1996.

operations across the mission spectrum, it continued to accept the need to conduct such missions in any topographical environment, including the desert. Doctrinal literature reflected this trend through the steady flow of missions and operations once considered "special" into the "standard" category.

Other principal armor doctrinal projects included revising FM 71-1: Tank and Mechanized Company Team, updating the related ARTEP, and updating FM 17-12-1-1 & -2: Tank Combat Tables - M1 Volumes I and II. These projects addressed current needs of armor units but remained under development throughout 1996. FM 71-1 had not been updated in nearly ten years, despite the dramatic changes in the world situation and its likely impact on the battlefield. FM 17-12-1-1 & -2 entered the final draft stage, but completion awaited the final results of test fires using the new guidelines. They incorporated changes necessary to accommodate the M1-series tanks, including anticipated needs for the M1A2.⁵⁹ Collectively, these projects addressed activities considered critical to armor units in the field: gunnery, combined arms operations, and training. While senior Army planners focused upon the future digital battlefield, field units still had to train soldiers and maintain readiness for the battles of today. The armor doctrinal projects underway in 1996 sought to meet this need.

The publication of FM 17-15: Tank Platoon constituted the most significant armor doctrinal product for armor in 1996. Published in April, a nine-year gap separated the new edition from its predecessor. It was the result of a major effort to update the manual, supported by General Maggart, COL Ritter, and the Armor Center in general. The need to update FM 17-15 came in part from the continuous modernization of other tactical manuals. Their modernization had eroded the relevance and utility of FM 17-15.⁶⁰

The new manual was written as a learning tool. Its writers sought to provide a tool to help develop platoon leaders and help them to think and operate in a tactical environment. FM 17-15 did not provide a collection of templated solutions to problems. Instead it provided principles of operation for application in a variety of situations with clear explanations of their utility. In keeping with a general emphasis upon developing commanders, the manual also stressed troop leading procedures and the factors influencing decision-making. Field units responded to these efforts with universal praise. Following its dissemination, a survey of user reactions revealed great appreciation for the manual as a training tool for platoon leaders.⁶¹ This praise underscored a key Army reality: at the lowest levels soldiers and junior officers received much of their training from their unit, not the training institutions.

Compared to its predecessor the new FM 17-15 proved a model of clarity and simplicity. Chapter 1 introduced the reader to company and platoon organizations and described the main features of those tanks likely to be found in an American tank platoon. Chapter 2 addressed battle command with a much greater focus upon command procedures. The earlier edition had included descriptions of specific operations, fire patterns, and security. These topics now received greater coverage in other chapters. Battle command stressed the decision-making process and communicating intent--relevant topics for either digital or non-digital operations. Chapters 3 and 4 addressed offensive and defensive operations, respectively. The emphasis lay upon the planning, preparation, and execution of different tactical operations, including actions on the objective. Platoon leaders received a set of possible solutions and the rationale behind them. They could see how basic troop leading procedures applied in a variety of operations, yet were encouraged to apply fundamental principles to fit tactical needs. Chapter 5 addressed other operations considered standard, including the conduct of tactical road marches, organizing an assembly area, and executing breaching actions. In the earlier edition, these tasks had been found only in the appendices where they tended to receive less attention, despite being common and basic operations. Reflecting the growing expectations placed upon ground forces, the chapter grew from eight to forty-eight pages. It added instructions regarding convoy escort, screening missions, and follow and support operations. The last activity anticipated the need for tank platoons to support dismounted infantry and scouts who might require rapid assistance. Chapters 6 and 7 addressed combat support and

⁵⁹ DTDD, "Directorate of Training and Doctrine Development," briefing of MG George H. Harmeyer, November 25, 1996.

⁶⁰ Dr. Robert S. Cameron, "FM 17-15: Tank Platoon, April 1996," memorandum for record, September 26, 1997.

⁶¹ Dr. Robert S. Cameron, "FM 17-15: Tank Platoon, April 1996," memorandum for record, September 26, 1997.

service support. While similar in layout and content to the 1987 edition, the new manual offered a full description and explanation of the call for fire process. This chapter also offered guidance on how tank platoons should react to hostile support elements, including helicopters.⁶²

Instead of providing general overviews of special operations that the platoon might have to conduct, the appendices of the new manual elaborated upon themes already addressed. Of particular importance were the appendices devoted to OOTW, fratricide prevention, environmental issues, and light/heavy operations. The incorporation of these topics reflected more widespread changes in doctrine. OOTW and environmental concerns could be found in most manuals, indicating their growing prominence throughout the Army. Fratricide prevention remained a major concern since the Gulf War. It required attention, but it was not an operation per se, mandating its own chapter. Light/heavy operations received more detailed coverage in FM 71-1, but Appendix B in FM 17-15 provided the platoon leader immediate guidance on how to integrate tank actions with those of dismounted troops at the lowest level. In past eras tank-infantry coordination had suffered from the ignorance of the tanker and the rifleman for the strengths and weaknesses of each other. Appendix B provided this information in a simple, clear manner. It also described the action of tanks in the infantry support rather than the maneuver role, highlighting key differences. Instructions showing how to load riflemen onto tanks demonstrated a level of detail in heavy/light operations lacking in previous manuals of this type.⁶³ MOUT received only a passing reference, however, since the upcoming revision of FM 71-1 was expected to address this topic in detail.⁶⁴

⁶² Headquarters, Department of the Army, FM 17-15: Tank Platoon, April 3, 1996.

⁶³ Headquarters, Department of the Army, FM 17-15: Tank Platoon, April 3, 1996, Appendices A through F.

⁶⁴ Dr. Robert S. Cameron, "FM 17-15: Tank Platoon, April 1996," memorandum for record, September 26, 1997.

CHAPTER 6 SYNOPSIS

This chapter describes principal force development projects and issues addressed by the Armor Center. It provides an overview of their status and activity. These developments are linked to trends within the Army and Department of Defense to show the broader context in which local force development occurred. This chapter does not attempt to discuss all ongoing projects.

Chapter 6: Force Development

In 1996 an emerging vision of the future battlefield and resource availability shaped the course of force developments. The Army's vision of the future anticipated a massive increase in the capabilities of Information Age technology and sought to harness them to combat operations. Development of the necessary technology began to result in the realization of practical applications. Continued development was vital to ensure American superiority on the 21st Century battlefields. However, incorporating Information Age technology into the Army force structure required an expensive modernization effort that contradicted efforts to reduce the military's size and budget. Modernization remained in competition with current force needs and the cost of contingency operations. In the restrained budget environment of the 1990s, modernization also became a victim of conflicts of interest within the Department of Defense.

Modernization

The Army's modernization needs stemmed from its expectations of the future battlefield. Military planners expected this battlefield to be shaped and influenced by technology, especially information technology. Joint Vision 2010 provided the armed forces with a common framework to guide doctrinal and matériel development. It aimed at sustaining American superiority in multiservice and coalition operations. Its view of warfare in the 21st century rested upon four areas: dominant maneuver, precision engagement, full dimensional protection, and focused logistics. Information technology would provide the means to secure the information dominance considered a prerequisite for success in each area.¹ Army Vision 2010 derived from this joint concept, guiding Army developments that would ensure effective operation as part of a joint warfighting team. It emphasized the continued value of ground forces but expected their operations to occur on an electronically linked battlefield. Digital technology would provide this linkage, permitting an acceleration of basic functions and greater coordination of more widely dispersed forces. Such technology would enable the massing of weapon effects without actually concentrating the weapons themselves.² Throughout 1996 the Army prepared to test the ability to digital organizations and matériel to realize this vision through its Advanced Warfighting Experiments process. The EXFOR served as a field laboratory to evaluate the impact of information technology upon force structure, training, doctrine, command, and support.³

Building a force capable of realizing Army Vision 2010 and Joint Vision 2010, required more than simply adding new gadgets to existing weapon platforms. The Army needed new systems with embedded technology capable of interacting with platforms from all branches. An Information Age Army required a digital force capable of exploiting information technology and merging it with the latest developments in firepower, mobility, and protection. In addition this digital force would have to encompass the entire Army, or the potential value of digital technology would remain unrealized. Digitizing the Army thus became a clear modernization goal, but the method of achieving it remained unclear. Downsizing and budget cuts plunged the Army back to a level of resourcing similar to that experienced between World Wars I and II. Yet digitization required massive, sustained funding that had to be balanced against current needs and operating expenses. This funding could not be assumed, especially following a Government Accounting Office report labeling Army digitization efforts risky, expensive, and inadequately controlled. The AWE Task Force XXI in particular was cited as costing an estimated \$258 million yet possessing no clear, measurable goals.⁴

¹ Sandra I. Meadows, "Information Dominance Anchors Vision of Joint Warfare in 2010," National Defense, LXXXII, 523 (December 1996) 12-13.

² "Vision 2010' Outlines Goals Beyond Force XXI, Before Army After Next," Inside the Army, November 11, 1996, pp. 1, 8-13.

³ "Digital Army No Silver Bullet, Cautions Chief," National Defense, LXXXII, 523 (December 1996) 34-35.

⁴ Dr. James W. Williams, "US Army Armor Center and Fort Knox Annual Command History," June 3, 1997, p. 3-12.

Modernization Strategy

The Army's ongoing efforts to move into the Information Age ensured that modernization needs retained a high visibility. The Secretary of the Army identified modernization as a key priority in 1996. Yet budget restraints required a balance between modernization needs, retention of the Army's current size, sustained readiness, and quality of life concerns. To achieve this balance the Army focused upon purchasing small numbers of new weapons with leap ahead technology rather than continuous upgrades to existing matériel. While existing weapon systems would be improved, emphasis would be placed on revolutionary designs that would replace them. These new systems were not expected to be fielded for several years. A gap would emerge between the capabilities of existing weapons and their replacements, but the absence of a major threat to the nation made this difference an acceptable risk.⁵

Force XXI served to modernize the military and prepare it for the 21st Century. Its goal lay in development of Army XXI. At Fort Hood the EXFOR functioned as a field laboratory, testing new tactical concepts and technology and applying them in a series of Advanced Warfighting Experiments intended to determine the force structure and technology used by Army XXI. Based upon performance during the AWE process, decisions would be made regarding the further development of individual equipment items and tactical concepts.⁶

Implementing this modernization plan depended upon a healthy research and development base. The acceptance of technological dominance on future battlefields required a capability to continuously evolve military technology and ensure its timely availability to field forces. The expected diversity of future threats and battlefields, however, complicated the attainment of this growth potential. The Army faced a challenge in sustaining its research and development base amid downsizing and budget reductions. Funding for research, development, and acquisition fell, but Assistant Secretary of the Army for Research, Development and Acquisition The Honorable Gilbert F. Decker fought to stabilize science and technology investments.⁷ Such investment represented the ability to develop new weapons before they would be required in combat. It focused upon selective advanced technologies and exploring promising research areas. Where appropriate, prototype equipment could be tested and evaluated during the AWE process.⁸

Critics of the military's modernization strategy identified two major weaknesses: its likeness to Cold War plans and its funding. Modernization remained rooted in the 1993 Bottom-Up Review that reflected Cold War rather than future needs. Nor did it ensure the timely development and procurement of new technology, since research and development investment was sacrificed to sustain a force structure capable of waging simultaneously two major regional conflicts. The Information Age seemed to require higher investments in technology, especially those related to information.⁹ Representative George R. Nethercutt, Jr. (R-WA), who served on the National Security Subcommittee of the House Appropriations Committee, argued that actual defense spending could not support the force structure large enough for two regional conflicts. Instead modernization suffered in the vain efforts to retain sufficient size and

⁵ Army Vice Chief of Staff General Ronald H. Griffith, Briefing presented during American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996; Secretary of the Army Togo D. West, Jr., "The Army Meets Today's Challenges While It Prepares for the 21st Century," Army, 46, 10 (October 1996) 15; Army Chief of Staff General Dennis J. Reimer, "The U.S. Army: 'The World's Premier Force'," Army, 46, 10 (October 1996) 22; Gilbert F. Decker, "R&D Perspective: An Army Perspective," Army RD&A, (November-December 1996) 2-3; Sandra I. Meadows, "Funding for New Weapons Bottoms Out in Fiscal '97," National Defense, LXXX, 517 (April 1996) 13-14.

⁶ Army Chief of Staff General Dennis J. Reimer, "The U.S. Army: 'The World's Premier Force'," Army, 46, 10 (October 1996) 22.

⁷ Gilbert F. Decker, "R&D Perspective: An Army Perspective," Army RD&A, (November-December 1996) 2-3.

⁸ Vincent P. Grimes, "Chiefs Face Onerous Choices in \$39B Modernization Effort," National Defense, LXXXI, 519 (July-August 1996) 16-21, 64, 66, 69.

⁹ Sandra I. Meadows, "Administration Defense Planners Called Back to the Drawing Board," National Defense, LXXX, 515 (February 1996) 14-15.

readiness. Moreover, the two conflict plan did not allow for current or anticipated contingency operations.¹⁰

For FY 97 readiness funding increased. While this increase suited the military's high deployment rate, it resulted in insufficient funds being allocated to replace aging weapons. Unplanned expenditures that included military pay raises and overseas operations further reduced the funds available for modernization. Between 1997 and 2001 research, development, testing and evaluation budget forecasts indicated a drop of nine percent from \$34.7 to \$31.7 billion. This decline paralleled an overall projected shortfall in modernization funding between \$2 and \$4 billion. In FY 97 the Army received the lowest percentage of the total research, development, and acquisition budget, triggering Congressional criticism and raising the visibility of modernization nationwide.¹¹ The Congressional Quadrennial Defense Review of 1997 would attempt to realign the military's force structure to fit 21st Century rather than Cold War needs.

Several solutions offered the potential of providing the funds necessary for modernization. The Clinton Administration began consideration of another round of BRAC. The reduced size of the military eliminated the need for large numbers of installations. Despite likely Congressional opposition, closing unnecessary installations seemed logical. Moreover, for those installations already closed, the annual savings finally reached a break-even point with the cost of closure. In FY 97 the Department of Defense expected BRAC savings to exceed costs by \$1.7 billion. By FY 00 the projected net savings rose to \$18 billion. However, rising environmental cleanup costs threatened to erode this savings. The high cost also reinforced opposition to further base closures. Why close military installations and reduce jobs without a large and rapid financial benefit to the military?¹²

Outsourcing provided another area of potential savings. Outsourcing contracted work previously done by federal employees to the private sector. This practice was not new in 1996, but the Department of Defense expected to increase the amount of such privatization to include weapons maintenance currently done at government depots at a cost of \$13 billion per year. These depots had been created during the Cold War to support the military in any conflict with the Soviet Union. By 1996 they were increasingly seen as a relic of a past era, and their usefulness came into question. Outsourcing appeared a proven method of realizing efficiencies. Figure 6.1 indicates the extent and type of outsourcing done by the military that generated an annual savings of \$1.5 billion. Polls of prominent and successful businesses indicated it to be a standard method of operation. The private sector also possessed the ability and interest in performing such work. Outsourcing provided additional sources of revenue from the sale of property no longer necessary, reduced operating costs, and a decreased need for new capital investment. These costs all transferred to the private sector. Estimates of the maximum benefit from outsourcing placed savings at an annual \$7-12 billion with a workforce reduced by 640,000 civilian and military personnel. The attractiveness of these figures seemed to balance a corresponding drop in modernization funding estimated at 70% over the past 11 years. Proponents expected to take the savings from outsourcing and apply it to modernization needs.¹³

¹⁰ Representative George R. Nethercutt, Jr., "Modernization and Strategy Redesign Imperative Issues," National Defense, LXXXI, 520 (September 1996) 38-39.

¹¹ Vincent P. Grimes, "Army Wants \$750 Million From Efficiencies Initiative," National Defense, LXXX, 515 (February 1996) 16-17; Sandra I. Meadows, "Funding for New Weapons Bottoms Out in Fiscal '97," National Defense, LXXX, 517 (April 1996) 13-14; Sandra I. Meadows, "Ready Force Now Runs in Tandem With Tomorrow's Weapon Systems," National Defense, LXXX, 518 (May-June 1996) 11-13.

¹² Sandra I. Meadows, "Funding for New Weapons Bottoms Out in Fiscal '97," National Defense, LXXX, 517 (April 1996) 13-14.

¹³ Sandra I. Meadows, "Outsourcing of Weapon Maintenance 'Inevitable,' Says Defense Depot Chief," National Defense, LXXX, 518 (May-June 1996) 27; "Migration of Defense Activities to Private Sector Gains Tempo," National Defense, LXXXI, 519 (July-August) 44-45; Robert H. Williams, "Outsourcing Could Generate Huge, New source of Defense Modernization Dollars," National Defense, LXXXII, 523 (December 1996) 24-27.

Figure 6.1: Current DoD Outsourcing for Principal Activities¹⁴

Activity	Percentage Outsourced
Base Commercial Activities	25
Depot Maintenance	28
Finance and Accounting	10
Army Aviation Training	70
Parts Distribution	33
Surplus Property Disposal	45

implementation of a major increase in outsourcing, however, faced several obstacles. Shifting government work to private contractors guaranteed the likelihood of more lawsuits by government workers who lost their job as a result. Laws and regulations also tended to hamper rapid and widespread privatization efforts. Each activity transferred to the private sector had to be preceded by a review of the relative performance costs of government and contract workers. Known as commercial activities studies, these reviews tended to be expensive and time-consuming. For the weapons maintenance depots, federal law prohibited more than 40% of the work performed from being privatized. Fears also existed that outsourcing the work of these installations would undermine readiness and place soldiers' lives at risk. The quality of contracted work remained suspect. Economic concerns motivated some opponents of outsourcing, who believed that the loss of government incomes would adversely impact local economies. This opposition ensured that increased privatization would become a political battlefield and happen gradually if at all.¹⁵

The heads of major defense firms offered the Department of Defense recommendations based upon their own companies' experiences. The Lockheed Martin Electronics President Thomas A. Corcoran, for example, outlined necessary reforms to enhance the financial vitality of government in general and the Department of Defense in particular. He stressed the need to reduce inefficient bureaucracies, including the elimination of unnecessary personnel. Acquisition reform required intensified efforts to ensure its practicality and utility. Funds allocated for defense purposes needed to be spent on defense matters and not channeled into nonmilitary activities. He also advocated an acceleration of those business initiatives proving effective such as the common process activity and the integrated product team.¹⁶

The Department of Defense also targeted the acquisition process as an area for greater efficiency. Constant revision of project plans and modifications to funding had resulted in regular cost overruns and delays. Changing this pattern required focus upon the manner of stabilizing the planning and resourcing of new programs.¹⁷ Reform efforts sought decreased time to develop, test, and field a weapon system without incurring massive cost overruns. Procuring better weapons faster became the principal goal of acquisition reform. According to Under Secretary of Defense for Acquisition and Technology the Honorable Paul G. Kaminski, cultural problems represented the main obstacles to effective acquisition reform. He cited the existing process as discouraging any form of risk-taking. The result was typical acquisition cycles of fifteen years. To break from such patterns, commercial practices were introduced wherever possible to provide a single standard policy based upon successful business methods. Overall

¹⁴ "Migration of Defense Activities to Private Sector Gains Tempo," National Defense, LXXXI, 519 (July-August) 44-45.

¹⁵ Sandra I. Meadows, "Outsourcing of Weapon Maintenance 'Inevitable,' Says Defense Depot Chief," National Defense, LXXX, 518 (May-June 1996) 27; "Migration of Defense Activities to Private Sector Gains Tempo," National Defense, LXXXI, 519 (July-August) 44-45; Robert H. Williams, "Outsourcing Could Generate Huge, New source of Defense Modernization Dollars," National Defense, LXXXII, 523 (December 1996) 24-27.

¹⁶ "Defense Industry Executive Outlines Actions for Preserving Viable Base," National Defense, LXXX, 517 (April 1996) 15.

¹⁷ Norman R. Augustine, "Acquisition Reform: Dream or Mirage?" Army RD&A, (September-October 1996) 20-22.

acquisition reform focused upon what equipment to purchase, the method of its purchase, and the nature of the supervision given to its development and acquisition.¹⁸

Such action paralleled broader government-wide efforts to streamline acquisition, represented by the Federal Acquisition Reform and Information Technology Management Reform Acts. These acts helped create an environment conducive to reinvention of the workforce and the acquisition process government-wide. They built upon the momentum started in 1994 with passage of the Federal Acquisition and Streamlining Act that promoted changes to the method of acquisition. Through 1996 acquisition reform continued to gain visibility and support that helped it to overcome bureaucratic inertia.¹⁹

The Army sought to generate funds without cutting force structure by seeking greater efficiencies in its administrative and business activities. Army Chief of Staff General Dennis J. Reimer sought the adoption of practices already implemented in private sector businesses. The activities affected by these efforts spanned a broad range that included logistical support, environmental cleanup, consolidation of contracts, travel procedures, redistribution of equipment from deactivated units, maintenance, and recycling. In a reversal of traditional Army trends, these efforts sought to encourage organizations to become more efficient and generate a cost-savings. Even greater reliance upon simulations was intended for research and development purposes. General Reimer's emphasis upon business efficiencies reinforced TRADOC's reinvention process begun in 1995. The need to generate funds for modernization motivated these efforts. With the likelihood of imminent shortfalls in such funding, the Army looked internally for ways to sustain necessary research, development, and acquisition without relying upon a Congressional bailout.²⁰

Responding to budget cuts anticipated in the period FY98-03, in 1996 the Army adopted a new policy. Instead of distributing small cuts throughout all ongoing projects, entire programs would be cut. The smaller across-the-board cuts tended to disrupt the development and acquisition of new equipment. Overall program costs and fielding time rose. Therefore the Army opted to focus on fewer but more stable programs capable of meeting timelines and fielding cycles. This policy required careful prioritization of each program. Those projects that encountered difficulty meeting timelines and budget estimates became prime targets, especially if they addressed only a limited need. Dropping such programs became an acceptable risk, since the Army expected no peer competitor abroad until about 2010.²¹ This policy underscored the importance identified by the Army Vice Chief of Staff General Griffith of concentrating available resources upon those programs deemed vital to digitization. The Army could not afford to digitize the entire Army.²²

The Armored Gun System became the first casualty of the new policy. The AGS was an 18.5-ton light armored vehicle intended to replace the M551A1 Sheridan in support of airborne and light infantry forces. It represented a major improvement over the Sheridan in firepower, protection, and mobility. The vehicle appeared ready to begin low rate initial production by late 1995 with full rate production scheduled for 1997. The corresponding training and doctrine packages had already been prepared. But in January 1996 it became clear that the AGS would be terminated because of fiscal pressures. The formal announcement by Army Acquisition Executive Gilbert F. Decker occurred on May 2, 1996. This action freed \$1 billion in long-term spending, but left the light forces without any armor support. Despite a demonstrated need for an AGS-type platform for early entry forces, the program received a lower priority

¹⁸ Under Secretary of Defense for Acquisition and Technology Addresses DOD Acquisition Reform Initiatives, Army RD&A (May-June 1996) 4.

¹⁹ "Acquisition Reform," Army RD&A, (May-June 1996) 50-51; Norman R. Augustine, "Acquisition Reform: Dream or Mirage?" Army RD&A, (September-October 1996) 20-22.

²⁰ Vincent P. Grimes, "Army Wants \$750 Million From Efficiencies Initiative," National Defense, LXXX, 515 (February 1996) 16-17.

²¹ Daniel G. Dupont and Tami Terella-Faram, "As DOD Debates Budget Plans, Army's New Modernization Strategy Holds," Inside the Army, August 19, 1996, pp. 1, 13-14.

²² Army Vice Chief of Staff General Ronald H. Griffith, Briefing presented during American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996.

than other ongoing projects. The termination was seen as a necessary but undesired act. Hopes that the project would remain alive through foreign sales--especially to Taiwan--failed to materialize in 1996.²³

Armor Modernization

The funding problems facing expensive and complex weapon systems made the establishment of a viable armor modernization plan critical. No clear vision of future armor existed and plans for future tanks ended with the M1A2 System Enhancement Package (SEP). A clear need existed to match the science and technology base available with the needs of the 21st Century battlefield and available funds. To address these issues General Maggart sought to establish a consensus in the armor community for a modernization plan. To provide a forum for the exchange of ideas and to build a single strategy for future armor development, he hosted Armor Caucus I in Atlanta, Georgia, in November 1995. This meeting of key personnel within the armor community resulted in a decision not to continuously evolve the Abrams tank, but to focus funds and effort into the development of a revolutionary Future Combat System incorporating leap ahead technology. This system would not be available until the 2010-2015 timeframe. In the interim the Abrams fleet would continue to equip heavy maneuver units, benefiting only from the insertion of select new technologies. Rather than build successive generations of tanks at great cost, armor leaders preferred to focus on a weapon intended for Information Age warfare that would become available about the time a peer competitor to the U.S. Army could be expected to emerge. In the interim the Abrams fleet would suffice to meet Mounted Force needs.²⁴

Following Armor Caucus I, General Maggart in his capacity as Chief of Armor commissioned study cells known as integrated concept teams (ICT) to analyze each of the critical problem areas facing the Armor Force. These included modernization of the Abrams tank fleet, ammunition and gun modernization, development of a future combat system, and development of a future cavalry and scout vehicle. These ICTs worked upon developing modernization plans and concepts that could be incorporated into the Army's budget planning process. Their members included representatives from TSM-Abrams, DFD, the Program Executive Office for Armored Systems Modernization, the Tank Automotive and Armaments Command, the Army Research Laboratory, and other research and development commands. The ICTs provided recommendations that related their analysis areas to the Army's operational needs, Force XXI, and estimates of costs and production numbers. Their findings were refined during briefings to FORSCOM commanders, general officers, and the Army Vice Chief of Staff. These activities provided the basis for a tank modernization plan that assumed no further Abrams upgrade beyond the M1A2 and focused upon the FCS.²⁵

The ICT process brought combat developers, matériel developers, scientists, engineers, and users together to plan the design and development of new equipment. It served to provide a unity of purpose among those parties who actually design and build equipment and reduce the confusion and delays traditionally associated with the Army's acquisition process. General Maggart and the Armor Center played a central role in developing the ICT idea, and it in turn became the focus of the newly published

²³ TSM Abrams, Input for 1996 Annual Command History, May 2, 1997; Army Acquisition Executive Gilbert F. Decker, SARD-SC, "Armored Gun System," Memorandum, May 2, 1996, with TSM Abrams input; Jason Sherman, "Budget Squeeze Drives Army to Terminate Armored Gun System Program," *Inside the Army*, Special Report, January 26, 1996; "Taiwan No Longer Interested in AGS; No Other Sales Working," *Inside the Army*, February 12, 1996, p. 9.

²⁴ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 11-13; MG Lon E. Maggart, Briefing presented during American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996.

²⁵ MG Lon E. Maggart, ATZK-FDM (70-1i), "Tasking Order for Establishment of Armor Modernization Integrated Concept Teams," undated, with DFD input for 1996 Annual Command History, Systems Division, Tab A/2; USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 11-13; Jason Sherman, "Knox Recommends Army Pursue All-Electric Future Main Battle Tank," *Inside the Army*, March 11, 1996, pp. 1, 6-7.

TRADOC "Blackbook" that provided guidance for requirements determination. The Blackbook provided for a more disciplined requirements determination process that eliminated the obstructions posed by excessive regulations. It was part of TRADOC's efforts as a reinvention center to realize efficiencies.²⁶

The recommendation of the Armor Caucus and the resultant ICTs raised questions in Congress and in the Secretary of Defense concerning technical feasibility, cost, the impact upon industrial expertise, and readiness. Moreover, these recommendations differed from those offered by the Army Science Board. Led by General Glenn Otis (Ret.), this Board undertook an independent study of tank development and modernization needs. It concluded that focus upon a future tank was premature. Instead the tank fleet should be continuously upgraded until technological developments made a new design prudent and cost effective, probably not before 2020. M1A2 production should be expanded to include the entire active component, requiring an additional 1967 tanks above the 1079 already planned. To complement platform upgrades the Board also recommended the development of smart ammunition and improvements to target acquisition and survivability. The latter included signature reduction, active armor, and warning sensors.²⁷

The more traditional evolutionary approach recommended by the Army Science Board posed a financial problem. Expansion of the Abrams program did not seem likely when research and development funds between FY99 and FY03 were acknowledged to be \$65 million short. This shortfall would impact upon the high payoff improvements desired.²⁸ Effectively, in deciding between the two modernization plans the Army had to determine whether to focus its funding upon extensive upgrades to the Abrams fleet or the FCS. The Senate Armed Services Committee sensed an Army dilemma concerning tank development. It emphasized the importance of proper planning and preparation to avoid future problems similar to those experienced with tank development in the 1960s and 1970s. Yet it did not consider Army's efforts to review tank modernization sufficiently focused. To assist the Army the Committee authorized \$12 million in FY97 for studies to be conducted on tank development beyond the M1A2. These studies were to help determine the best weapon system to support the Army's operational concepts, defeat an evolving threat, integrate new technology, and plan a method of development.²⁹

In June 1996 the Armor Center hosted Armor Caucus II at Fort Knox, during the annual Armor Conference. This meeting affirmed the recommendations of Armor Caucus I and reviewed the actions of the ICTs. It acknowledged the difference in modernization strategy with the Army Science Board's evolutionary approach, but continued its support for focus upon the FCS. The Armor Center recommended that this platform be ready for production by 2015 and that no major expansion of M1A2 production occur. In preparation the Armor Center would undertake a study of the science and technology base currently available and assess how it might be linked to FCS development. Such a review was considered vital to translating FCS needs into quantifiable input for budget planning. General Maggart also ensured that the Armor Center would define the capabilities desired for the new platform. Discussion of FCS characteristics indicated an interest in researching a variety of potential armaments, establishing a weight at 30-40% that of the Abrams tank, and generating major increases in lethality, survivability, deployability, and mobility. The FCS would not be developed incrementally as a result of upgrades to the Abrams fleet. Funding for the program was to begin in FY98, but the Caucus acknowledged that shortfalls in Army budget levels would delay development.³⁰

²⁶ MG Lon E. Maggart, Opening remarks for American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996.

²⁷ Jason Sherman, "Science Board Study Recommends Continued Upgrades to Abrams Tanks," Inside the Army, May 20, 1996, pp. 1, 8-10; USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 14-15.

²⁸ Jason Sherman, "Armor Caucus Blesses Future Combat System, Directs Technology Review," Inside the Army, June 17, 1996, pp. 1, 12-14.

²⁹ "Authorizers Earmark \$12 Million to Fund New Army Tank Studies," Inside the Army, May 20, 1996, p. 8.

³⁰ Project Leader Jacqueline M. Allen-Peters, ATZK-FD (70-1i), "Armor General Officer Caucus II, 6 June 1996, memorandum for record, June 8, 1996, with DFD input for 1996 Annual Command History, Systems Division, Tab C; USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September

For the M1A2 the Caucus determined to introduce only selective new technologies that promised major increases in capability. These high payoff improvements represented the extent of the upgrade policy. Although the M1A2 had initially been intended to be upgunned to a 140-mm gun, the Caucus abandoned this plan. This weapon would have required an expensive turret redesign that would have constituted a major investment in a weapon system by then overdue for replacement. The Caucus affirmed that continuous development of the M1A2 and the FCS were not affordable. A sustainment and upgrade program for the rest of the Abrams fleet would increase its capabilities and ensure battlefield compatibility with the digital M1A2. New ammunition and development of an enhanced 120-mm gun would further help an aging tank fleet retain its combat effectiveness. The Caucus members considered the risk of the Abrams fleet being overmatched on the battlefield in the near future worth the potential value of the FCS. Their primary goals following the Caucus lay in securing the support of the senior Army leadership to include funding the necessary science and technology effort.³¹

Tank Modernization Plan

The consensus achieved during Armor Caucus I and II guided the development of the Tank Modernization Plan. Approved in September 1996, this plan indicated how armor modernization would occur into the 21st Century. It mapped out the course that would be followed to move the current Abrams tank fleet to the future represented by the FCS. It established the technological enhancements to be incorporated into each version of the Abrams tank and corresponding timelines. It mapped out the process of bringing the entire fleet to a state of similar operating capabilities suited to the Force XXI battlefield. It addressed the corresponding development of tank guns, ammunition, and training devices, and it concluded with an overview of the requisite capabilities for the FCS.³²

The modernization plan reflected an assessment of current trends in tank development and threat technology. It considered the most pressing threats to come from anti-tank guided missiles (ATGM), top-attack systems, and advanced kinetic energy projectiles. Its purpose lay in ensuring the dominance of American tanks into the 21st Century. To achieve this goal, emphasis would be placed upon overmatch technology suited to the future battlefield environment. The plan developers anticipated major increases in the use and capabilities of information technology within twenty years. Versatility would be required to permit a projection force Army to perform conventional operations, Information Age warfare, and OOTW. The nature of the threat would also become more varied. Late model Russian-built tanks from T-72s through T-90s were expected to increase in numbers, but the greatest concentrations would shift from Europe to the Middle East and Asia. The technological threat was expected to increase through the proliferation of upgrade packages that when applied to older tanks would dramatically increase their capabilities. Combined with a similar increase in the array of antitank weapons, potential battlefield enemies would find it easier to acquire technology capable of destroying the Abrams tank.³³ The modernization plan sought to ensure that the Abrams tank would continue to remain a viable weapon in this environment.

The plan specified the near, mid, and far-term improvements to be made to each version of the Abrams tank. The M60 would soon disappear completely from the Army's inventory. The M1/IPM1 currently serving only with the NG was to be removed from service as soon as possible. Until then only

9, 1996, pp. 13-15; Jason Sherman, "Armor Caucus Blesses Future Combat System, Directs Technology Review," Inside the Army, June 17, 1996, pp. 1, 12-14.

³¹ Project Leader Jacqueline M. Allen-Peters, ATZK-FD (70-1i), "Armor General Officer Caucus II, 6 June 1996, memorandum for record, June 8, 1996, with DFD input for 1996 Annual Command History, Systems Division, Tab C; USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 13-15; Jason Sherman, "Armor Caucus Blesses Future Combat System, Directs Technology Review," Inside the Army, June 17, 1996, pp. 1, 12-14.

³² USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996.

³³ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 5-8.

minor safety modifications and those changes necessitated by Operation Desert Storm would be implemented.³⁴

Once removed from service the M1s would be rebuilt as M1A2s. The tanks would be sent to Anniston Army Depot, where their turrets would be removed, stripped, and disposed. Designed to house the M68 105-mm gun, M1 turrets could not accommodate the M256 120-mm gun or the electronics of the M1A2. The hull would be stripped and disassembled into its components prior to shipment to the Lima Army Tank Plant, where a new turret would be added and new components added to the hull. The final assembly would result in a "new" M1A2. This process was expected to benefit from component improvements. Each reclaimed M1 would possess the most advanced components and technology. This program also served to preserve tank production capability.³⁵

The M1A1 would continue to comprise the bulk of the tank fleet for the next twenty years. Its modernization was imperative to offset the limited production planned for the M1A2. The minimum changes considered necessary to retain M1A1 combat effectiveness are summarized in Figure 6.2. These changes were ongoing in 1996 and in addition to the M1 safety and operational modifications also due to be incorporated into the M1A1.

Figure 6.2: Ongoing Upgrades to the M1A1³⁶

Item	Description
VIS	Digital intercom for tank crew communications
PLGR	Processes satellite signals to determine position, velocity, and time
Armaments Incentive Initiative	Focus on ammunition improvements, gun mount upgrade, new ballistic solutions for ballistics computer, changes in Gunner's Auxiliary Sight reticle
Battlefield Override	Permits manual control of engine and transmission to allow emergency withdrawal from combat
Pulse Jet System	Reduce air filter maintenance in dust-heavy environments
Improved Plenum Seal	Helps reduce engine damage from foreign objects getting into engine
Mounted Water Ration Heater	Allows crew to heat water and rations while inside tank
External Auxiliary Power Unit	Small external power source that enables operational of electrical systems without running tank engine

Figure 6.3 illustrates the next phase of pre-planned improvements. These modifications are intended to provide the M1A1 with the capability to operate and survive on the digital battlefield. Currently under development, they are likely to be fully integrated with the tank within a few years.

³⁴ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, p. 17; Sandra I. Meadows, "Army Vehicle Programs Breed Information Age Warwagons," National Defense, LXXXI, 520 (September 1996) 30-31.

³⁵ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 25-26.

³⁶ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 18-19.

Figure 6.3: Mid-Term M1A1 Upgrades³⁷

Item	Description
Vehicle Integrated Defense System	Array of sensors and countermeasures to detect and react to threats including top-attack munitions, ATGMs, conventional rounds, and mines. Also known as Suite of Survivability Enhancement Systems.
Front and side armor upgrade	Raise level of protection comparable to M1A2 through incorporation of second generation depleted uranium armor.
Appliqué Force XXI Command and Control	Digital command and control package to provide connectivity with digital forces and enhanced situational awareness
Improved Fire Control	Longer range accuracy
Driver's Viewer Enhancement	Permits better vision over longer range for driver

A series of future improvements, illustrated in Figure 6.4, has already been planned. However, these changes represent concepts rather than definite programs. Moreover, their funding depended upon the completion of the mid-term modifications listed above.

Figure 6.4: Possible Future M1A1 Upgrades³⁸

Item	Description
Eyesafe Laser Rangefinder	Reduce hazard posed by laser rangefinder
Driver's Vision Enhancement	Thermal imaging with digital display that permits information observed to be sent digitally to other crew stations or other vehicles
Digital Electronics Control Unit	Improved electronic control of engine and diagnostic tests to increase efficiency and reliability of engine
Second Generation Forward Looking Infrared for Gunner's Primary Sight	Provide gunner same vision capability as M1A2 SEP. Leverages SEP technology already under development.
Titanium components	Reduce overall weight of vehicle

To sustain the M1A1 fleet the modernization plan embraced the Abrams Integrated Management XXI (AIM XXI). This program seeks to extend the life of the M1A1 by rebuilding it with new or improved components, using the facilities and labor of government *and* industry. Older vehicles removed from the field have their turrets removed. The hull and turret assemblies are then disassembled into their component parts. Each part is inspected, cleaned and/or replaced with a similar new part or an improved part recently developed. The tank is then rebuilt and reissued. The value of this program lies in its ability to integrate emerging technologies into the M1A1 without redesigning the vehicle. Each tank thus serviced should have a greatly extended service life and field maintenance costs should drop. Its parts will be interchangeable with those of the M1A2. It also would preserve the industrial expertise necessary for future vehicle production. The last new production M1A1 reached the Army in 1993. Although the tank

³⁷ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, p. 20.

³⁸ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, p. 21.

will constitute the bulk of the armor fleet for the foreseeable future, no more will be built. Thus AIM XXI is vital to the continued combat value of the tank fleet.³⁹

The modernization plan provided an overview description of the M1A2, highlighting the differences between it and the M1A1. In effect the M1A2 represented a fundamentally different tank, and the plan described it as "The First Information Age System."⁴⁰ The most significant change lay in the vehicle's electronic package built around a 1553B Data Bus and RS-485 Power Bus. This core architecture transformed the information highway of the commercial world into battlefield digitization. It permitted the automated collection, generation, communication, storage, and display of tactical information. Two duplicate computer systems--a hull processing unit and a turret processing unit--provided a redundant capability. Damage to either system would not impair the tank's operation. The electronic architecture comprised multiple linked subsystems that ran simultaneously and shared data without any crew input. It automatically processed data regarding navigation, tactical operations, and fire control, displaying the information automatically to the crew and/or to other vehicles. It also ran a continuous series of self-diagnostic tests to determine mechanical and electronic failures. Once it discovered such a fault, it indicated the problem to the crew and reconfigured the vehicle's hardware to optimize performance around the fault. It automatically tracked and communicated positional information on its host tank and targets to the crew and other vehicles. This digital capability also crossed language barriers. The M1A2s built for the Saudi Arabian and Kuwaiti Armies included the ability to switch from Arabic to English displays with the touch of a button. Behind this digital capability lay a desire to unburden the crew from routine, time-consuming reporting and monitoring tasks.⁴¹

Information is displayed to the crew and other vehicles digitally linked to the tank via the Inter Vehicular Information System (IVIS). IVIS includes displays and controls that present and communicate information. For command and control purposes, it provides near real-time updates to the tactical situation, permitting units to respond faster to battlefield events. This ability was displayed during AWE Focused Dispatch. The SINCGARS radio acts as the medium of transmission and reception between vehicles.⁴² Other distinctive features are illustrated in Figure 6.5.

The modernization plan established a series of pre-planned improvements to the M1A2. Those upgrades currently under development and intended for near-term insertion constitute the System Enhancement Package (SEP). SEP is expected to meet anticipated requirements through 2006, and it incorporated the digitization experience obtained from the AWE process. The most important part of the SEP lay in the upgrade to the core electronics. The M1A2 would undergo major improvements to its computer architecture to align the vehicle with the latest advances in computer technology and to permit easy assimilation of changes in command and control software. The SEP sought to ensure sufficient computer growth potential for several years. The subsystems associated with intra-vehicular operations remained separate from those subsystems that supported intervehicular functions. Thus upgrades to the command and control system can be done through software changes without altering the intra-vehicular systems or the basic electronic architecture. Currently such software changes happen frequently, and this trend is likely to continue as the Army builds its tactical internet. Consequently, the SEP constitutes a

³⁹ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 18, 41-42; Program Manager COL Christopher V. Cardine, Briefing presented during American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996.

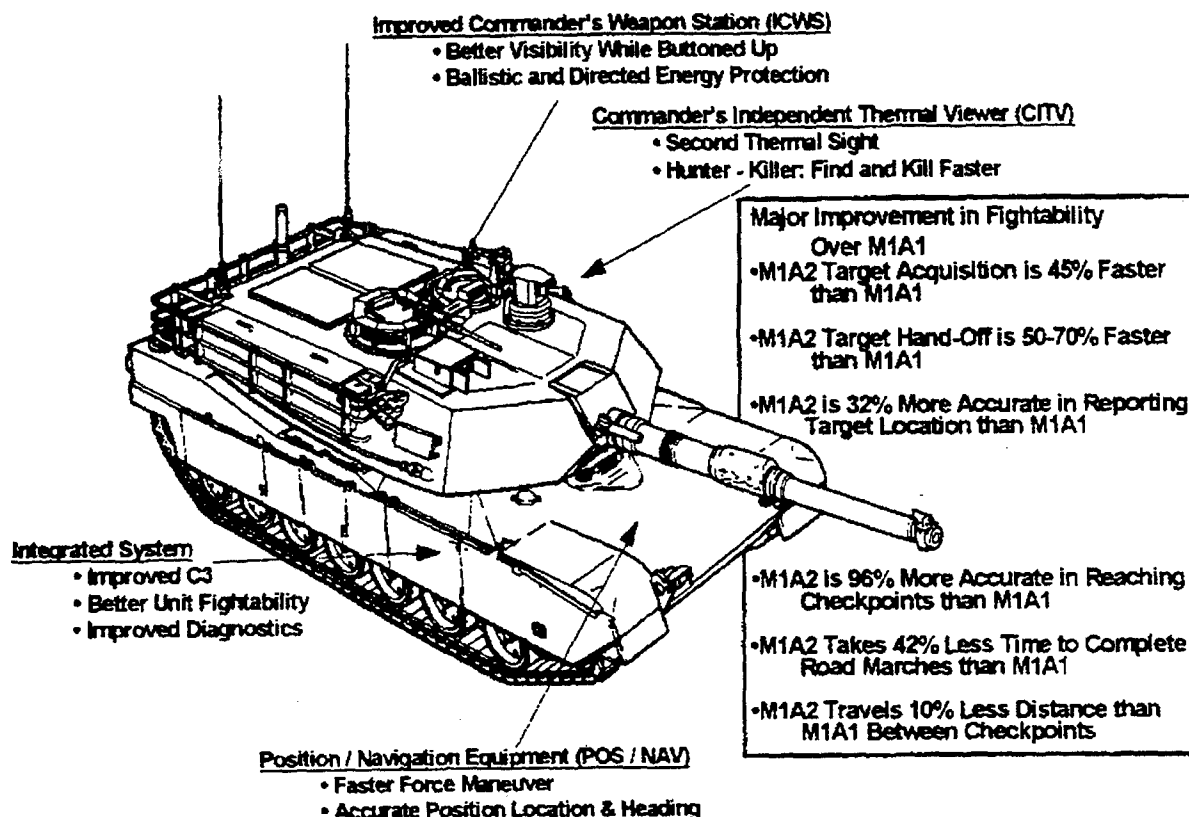
⁴⁰ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, p. 22.

⁴¹ Program Manager COL Christopher V. Cardine, Briefing presented during American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996; MG John E. Longhouser, "Converting Computing power Into Combat Power," Army RD&A, (March-April 1996) 4-8; LTC George Patten and Jimmy W. Whitely, "The World's First Information Age Ground Combat Weapon System," Army RD&A, (September-October 1996), 23-27; Sandra I. Meadows, "Army Vehicle Programs Breed Information Age Warwagons," National Defense, LXXXI, 520 (September 1996) 30-31; USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 22-25.

⁴² USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 22-24.

major efficiency and cost savings. Unlike the original M1A2, command and control software will no longer be unique but common to that utilized in other vehicles and organizations under the Army's Appliqué program.⁴³

Figure 6.5: M1A2 Features⁴⁴



In general the SEP sought to streamline communication management. The addition of a mass memory unit should provide considerably expanded data storage capacity. The electronic changes coupled with the addition of color displays and improved processors will also permit use of digital maps. The use of lighter tracks and the introduction of titanium parts should lower the vehicle's overall weight. Its component elements are to be applied to production starting in FY99. Those tanks built before final

⁴³ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 26-32; Program Manager COL Christopher V. Cardine, Briefing presented during American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996; Wes Glasgow, COL Christopher V. Cardine, and David Latson, "The M1A2: Current and Future Program Plans," *Armor*, CV, 3 (May-June 1996) 13-14.

⁴⁴ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, p. 22.

development of the SEP will be retrofitted so that all 1,079 M1A2s built will ultimately possess the same configuration.⁴⁵ Figure 6.6 indicates the principal features of the SEP.

Figure 6.6: M1A2 SEP Features⁴⁶

Item	Description
Upgraded electronics and command and control	Upgrade the core electronic architecture and enhance inter-vehicle connectivity
Second Generation Forward Looking Infrared and optical improvements	Increase target detection, recognition, and identification ranges
Under Armor Auxiliary Power Unit	Separate armored power source that permits full use of electronics without running tank engine
Environmental Cooling	Stabilizes internal temperature to increase crew and computer operability

Although the SEP represents the most significant change to the M1A2, further upgrades are planned to take advantage of emerging technologies. These upgrades, however, represent an attempt to incorporate select technologies that will significantly increase the tank's effectiveness. They do not represent sweeping changes, but they are intended to ensure battlefield supremacy in the period 2006 through 2015. Figure 6.7 illustrates this next batch of improvements.

Figure 6.7: Mid-Term M1A2 Improvements⁴⁷

Item	Description
Vehicle Integrated Defense System	Array of sensors and countermeasures to detect and react to threats including top-attack munitions, ATGMs, conventional rounds, and mines. Also known as Suite of Survivability Enhancement Systems.
Armor upgrades	Improved depleted uranium armor to front and sides
Target Acquisition and Fire Control Improvements	Combination of improved electronics and second generation forward looking infrared technology to permit automated target acquisition, recognition, and tracking

The modernization plan also called for improvements in the main gun and ammunition for the entire Abrams fleet. All tanks would eventually carry the M256 120-mm gun, but an improved version would be developed, designated the XM 291. This weapon is also a 120-mm gun, but it has the capability to fire ammunition for 120-mm through 155-mm by changing the gun tube. The Army's primary interest, however, lay in its ability to provide greater penetration with 120-mm ammunition. The XM 291 possesses

⁴⁵ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 27-32; Peter M. Keating, "Agile, Elusive Armored Killer Will Stalk 21st Century Arena," National Defense, LXXXI, 520 (September 1996) 32-33; Christopher T. Heun, "Army and Abrams Tank Linked for the Long Haul," National Defense, LXXXI, 522 (November 1996) 20-22.

⁴⁶ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 27-31.

⁴⁷ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 32-34.

a thicker and longer gun tube that permits the use of more powerful propellants in ammunition. However, this weapon is intended only for development; only if a sufficient threat emerges will it enter production.⁴⁸

Direct fire engagements were expected to be the principal form of engagement into the 21st Century. Ammunition development thus focused upon a mix of conventional kinetic energy and smart rounds. This dual focus reflected the recommendations of the ICT charged with gun and ammunition modernization. Smart munitions under development included the XM 943 Smart Target-Activated Fire and Forget round and the Tank Extended Range Munition. The former was a top-attack round that would be developed but not fielded unless required. The latter was intended for engaging non line-of-sight targets. Scouts would identify targets outside the tank's line-of-sight. These targets would then be engaged with TERM outside the target's engagement range. Identification of the target for the tank could also be done digitally. Although a recognized need for an antipersonnel round existed, none was planned for the 120-mm gun. Overall, modernization of ammunition focused upon reduced safety risk, better performance, and decreased gun tube wear.⁴⁹

While the modernization plan focused upon the specific needs of the Abrams fleet, it also established the basic parameters and need for the FCS. The Abrams tank was not expected to fulfil the needs of the Army After Next, having finally outgrown its growth potential. A revolutionary system would be required that utilized the most advanced technologies available. The modernization plan described the desired capabilities of the FCS and its timeline in development. Production was set at 2015, with the finalization of a mission requirement statement and operational requirements document by 2005. Before that date, research would have to have begun. The plan writers expected the incorporation of an electric main armament and drive likely.⁵⁰

In the wake of the decisions reached by Armor Caucus I and II, General Maggart considered determination of the general capabilities desired of the FCS his most important priority. He envisioned a fast, small, hard-to-see, hard-to-hit, easily deployable vehicle. Indeed for both the FCS and the Future Scout and Cavalry Vehicle (FSCV), he considered deployability, speed, and sustainability to be vital features. Only vehicles possessing such characteristics would be capable of realizing his vision of decisive operations on the nonlinear battlefield of the future. He considered it likely that the FCS would be an electric vehicle mounting the electromagnetic gun still in a design phase.⁵¹ His views found reflection in the desired characteristics for the FCS described in the Tank Modernization Plan and summarized in Figure 6.8. Within the armor community and the Army Science Board a desire existed to break away from the traditional view of the tank. The adoption of the term Future Combat System in lieu of the Future Main Battle Tank reflected this interest. The ideal FCS was a vehicle that possessed none of the traditional features associated with current and past tanks but possessed much greater overall effectiveness.⁵²

In designing and developing such a system, the armament and power source remained the most critical elements but also carried the highest risk. Considerable interest existed in the electromagnetic gun. Research already underway for this weapon carried great promise, but remained largely untested. Problems remained in its practical development that would require time and money to resolve. Such resources could not be guaranteed in the budgetary environment of the 1990s. No new engines or alternative power sources currently existed. The desire for a power source other than one based upon the internal combustion engine encouraged interest in an electric tank in which all of the vehicle's components drew their power from a single source. However, new engine designs traditionally required at least fifteen

⁴⁸ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, p. 53.]

⁴⁹ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 55-59.

⁵⁰ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 61-65.

⁵¹ MG Lon E. Maggart, Briefing presented during American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996; Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, August 13, 1996.

⁵² Panel discussion on Future Mounted Systems at American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996.

years to develop fully. To meet the production start point of 2015, development of such a power source had to start in the very near future, despite the absence of funds to do so.⁵³

Figure 6.8: Intended FCS Capabilities⁵⁴

Characteristic	Description
Lethality	Engage multiple moving or stationary targets at ranges up to 5 KM with near 100% kill probability
Survivability	Combination of passive and active measures to resist full range of current and anticipated weapons including NBC, chemical energy, laser, and electromagnetic attacks
Mobility	Maximum cross-country agility with speed of 100 KM/hour
Deployability	Capable of rapid air transport with 2 FCS per one C-17 aircraft
C3I	Digital integration and interoperability with all command levels
Sustainability	Logistical tail 50% of current level for Abrams tank
Joint and international operations	Compatible with multiple fuel and communication systems and transportable by variety of US and foreign transportation assets
Training	Embedded training and simplicity of operation
Soldier	Designed for continuous operations in all environments with consideration for crew needs

Armor Center Support for Tank Modernization

Within the Armor Center the Directorate of Force Development bore primary responsibility for implementing armor modernization. Previously designated the Directorate of Combat Developments, this organization underwent a name change that reflected the broadening range of activities that it oversaw. In addition to matériel development, DFD also conducted its own threat assessment based upon global developments and evolved cavalry and armor organizations. It also participated in training and doctrine developments together with the Mounted Maneuver Battle Lab. DFD represented the user in the Army's complex development and acquisition process, interacting with both field units and those individuals who actually developed and tested new equipment. Its visibility within TRADOC and the Army remained high because of the large dollar amounts associated with many of its programs.

In 1996 the ongoing TRADOC reorganization of its Science and Technology Program and Acquisition Reform resulted in several changes that directly affected DFD. The TRADOC commander received the authority to approve or disapprove all requirements associated with the AWE process. Moreover, at the Army Chief of Staff's direction TRADOC became responsible for streamlining the requirements determination process. It published four "Black Books" to describe the processes the Army would use to determine the requirements for future operational forces. Each school was directed to implement the process described in these books, especially the third one that dealt with requirements determination. Anticipating this action, General Maggart authorized a plan to reorganize and realign the programs, processes, missions, and resources of the Armor Center associated with the requirements process. A realignment of missions and resources of the Armor School, Mounted Battlespace Battle Lab, and Directorate of Combat Developments occurred. This action spurred creation of DTDD and resulted in

⁵³ DFD, Input for 1996 Annual Command History, Systems Division, Tab B.

⁵⁴ USAARMC and Armored Systems Modernization, "Tank Modernization Plan," September 9, 1996, pp. 62, 63.

the transferal of the Battle Lab's Science and Technology Division to DCD. DCD also implemented the ICTs referenced above and became DFD under a new director, COL John F. Kalb. The Battle Lab became the Mounted Maneuver Battlespace Lab, and its focus shifted to experimentation only. Overall these actions resulted in DFD becoming a model within TRADOC for implementation of its "Black Books."⁵⁵

DFD's ability to pursue its mission, however, suffered from personnel reductions. Projected manpower losses in FY97 resulted in an internal reorganization and loss of resources in 1996. Civilian work strength fell from thirty-nine to twenty-seven with further cuts anticipated in FY98. This reduction coincided with the heavy personnel demands from the operation of four ICTs. Reorganization resulted in the loss of the directorate's concept and design capabilities, resulting in the need to rely upon other installations to conduct analytical testing of matériel and organizational ideas. Despite the emphasis of the "Black Books" upon interaction and close coordination of those organizations concerned with a project's development, cuts in travel funds reduced DFD's ability to do so. Instead, it became increasingly dependent upon program managers and research facilities to provide travel money, reducing its independence and oversight capability for major armor projects.⁵⁶

DFD also participated in TRADOC's biannual Warfighting Lens Analysis. This process reviewed the Army's budget and recommended changes based upon a perceived ability to fight emerging threats in different timeframes. The process involved all of the schools and resulted in a prioritization of ongoing programs. From this process the TRADOC Warfighting Council determined which programs should have funding increased and which ones should be designated for decrements to pay for these increases. In 1996 the Abrams program was targeted for the loss of \$801.5 million between FY98 and FY03. Armor Center opposition resulted in this loss being reduced by half. However, the remaining cut still threatened the elimination of the tank program altogether and realization of the tank modernization plan. The Warfighting Lens Analysis team disregarded these objections and presented its recommendations to the Department of the Army in January 1997. The ability of DFD and the Armor Center to protect the budgets of critical armor programs appeared to be waning.⁵⁷

Following the realignment of training and force development functions the Mounted Maneuver Battle Lab's mission changed to reflect the loss of its Science and Technology Division. According to the new mission statement:

The Mounted Maneuver Battle Lab will plan and conduct experiments for the exploration of doctrine, material, organization, leader development, training development, and soldier development concepts. The MMBL will also act as the experimental action agent for the Mounted Force proponents.⁵⁸

The refocusing of the Battle Lab's efforts upon experimentation seemed to be a reversal of the original intention behind its creation. TRADOC's Battle Lab Program was implemented in 1992. The labs were intended to coordinate the separate development efforts undertaken by each branch. Without such coordination acquisition cycles tended to reflect only specific branch interests rather than those of the Army. The science and technology orientation of the Battle Labs provided them with the means to integrate the separate actions of the branches with the research and development capabilities of industry. Moreover the Battle Lab presence helped to ensure user representation in the development and acquisition process. Commercial developers responded favorably to these efforts by seeking Battle Lab input and observation of new and ongoing projects. Battle Lab influence in the science and technology

⁵⁵ DFD, Input for 1996 Annual Command History, Science and Technology Program.

⁵⁶ DFD, Input for 1996 Annual Command History; Dr. Robert S. Cameron, Interview with COL John Kalb, August 19, 1996.

⁵⁷ DFD, Input for 1996 Annual Command History, Science and Technology Program.

⁵⁸ MMBL, Briefing given to LTG Miller, August 21, 1996, notes and slides.

arena grew, and with it their ability to horizontally integrate research and development initiatives throughout the Army.⁵⁹

This trend ended with TRADOC's restructuring of its Science and Technology program. Research and development responsibility reverted back to the combat development directorates of each arm. These organizations reflected the interest of their parent branch, whom they served and represented. A danger existed that the entire acquisition process would again become subject to parochial and disconnected branch concerns that eroded the coordination efforts of the Battle Labs. The Mounted Maneuver Battlespace Lab, however, also faced the possibility of extinction when General Maggart sought its elimination. He saw no further need for the organization following the conclusion of Focused Dispatch. TRADOC, however, prevented this action.⁶⁰

In its experimentation role MMBL conducted several experiments that dealt with operational, matériel, and training issues. Figure 6.9 outlines some of the principal experiments undertaken in 1996. Other major initiatives included the development of the User Lab and the Mounted Warfare Testbed. The User Lab mission focused upon the evaluation and testing of those command and control systems that would impact upon the operation of command echelons through the brigade level. It was considered the optimum forum for integrating combat, training, doctrine, and matériel developers. It sought to incorporate command staffs into a virtual world in which all members of these staffs could be collectively or individually evaluated. Its principal value, however, lay in the merging of training and research with the actual soldiers who would apply the principals and technology on the battlefield. It differed from the User Jury concept in its emphasis upon command and control functions. User Jury focused upon the specific equipment that tank crewmen would use. User Lab development benefited from the support of CECOM. Its desired end state included a separate facility housing digital equipment that permitted the simulators on Fort Knox to communicate with one another and similar equipment on other posts. Thus the scope of the experiments undertaken could maximize the input of a variety of potential users. In 1996 the intended focus of the User Lab lay in testing concepts potentially useful to Force XXI. Although considered an important project, the fate of the User Lab remained uncertain. No final decision had been made regarding its funding. In August it possessed no budget and the contracts of its civilian employees were due to expire in October.⁶¹

The Mounted Warfare Testbed was intended to provide an interactive simulation environment in which to test matériel and doctrinal concepts in force-on-force engagements. The Testbed would provide a cost effective means of testing new ideas that might otherwise be considered too expensive in personnel and cost requirements, unsafe for field testing, or carry the potential for environmental damage. The Testbed complemented the User Lab and possessed a variety of simulators and terrain databases for experimental use. It was one of only four Distributed Interactive System (DIS) facilities owned by the Army but operated by contractors. DIS refers to simulators or emulators physically separated but linked electronically for interaction. In 1996 the Testbed continued to develop but ongoing experiments included tests of an electromagnetic gun, countermining operations, M1A2 simulator, command and control platforms, and Force XXI simulations. Work was still underway to link the Testbed with other simulator facilities on Fort Knox and other posts.⁶²

⁵⁹ MMBL, Overview briefing given to Dr. Robert S. Cameron, August 23, 1996; "Battle Lab History," Internet Source, Fort Knox Home Page: <http://147.238.100.101/center/mbbl/history.htm>.

⁶⁰ Dr. Robert S. Cameron, Interview with MG Lon E. Maggart, October 11, 1996; MMBL, Overview briefing given to Dr. Robert S. Cameron, August 23, 1996.

⁶¹ MG Lon E. Maggart, Briefing presented during American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996; Dr. James W. Williams, Interview with MG Lon E. Maggart, December 5, 1995, p. 10; MMBL, Overview briefing given to Dr. Robert S. Cameron, August 23, 1996; MMBL, Briefing given to LTG Miller, August 21, 1996, notes and slides.

⁶² "Mounted Warfare Test Bed," Internet source, Fort Knox Home Page, <http://147.238.100.101/center/mbbl/mwtb2.htm>; MMBL, Briefing given to LTG Miller, August 21, 1996, notes and slides; MMBL, Overview briefing given to Dr. Robert S. Cameron, August 23, 1996.

Figure 6.9: Principal MMBL Experiments of 1996⁶³

Experiment Name	Type	Description
Force Protection Experiment III	CEP	Test linkage between survivability, digital communications, situational awareness, and combat identification systems
Air-Ground Command Post Information Experiment	CEP	Demonstrate digital link between Army Airborne Command and Control System and Battle Command Vehicle
M1A2 Laser Radar Targeting System Applique Evaluation	CEP	Test ability of identify target, target range, and target location and communicate information digitally
Scout Laser Communications	CEP	Test validity of upgrading binoculars with digital equipment, including laser range finder and silent radio communications
Multi-Function Laser for Abrams	CEP	Assess ability of system to conduct eyesafe laser rangefinding and target profiling and non-eyesafe target designation
3d Generation AN/VSS2 Driver's Viewer	CEP	Evaluate capabilities of enhanced driver's nightsight
Signature Reduction Coating	CEP	Effort to decrease the infrared and radar signatures of armored vehicles
Automatic Target Acquisition and Identification Demonstration	ACT II	Use Battlefield Combat Identification System and MTI Ground Radar to enhance target identification and acquisition
Long Range Combat Identification Prototype	ACT II	Test viability of increasing range at which target can be identified and range and location pinpointed
Integrated Defense Functions	ACT II	Simulation for use in DIS environment to analyze vehicle hit avoidance during engagement
Biological Decontamination Device	ACT II	Viability test of use of broad band light technology to reduce risk by biological agents

⁶³ MMBL, Briefing given to LTG Miller, August 21, 1996, notes and slides.

Implementing the Tank Modernization Plan

Several steps toward realization of the modernization plan were taken in 1996. The M1 upgrade program that would transform over 1000 M1 tanks into M1A2s received funding through 2004. In July General Dynamics Land Systems received \$4.1 million to refurbish a small number of M1A1 tanks to test the viability of the AIM XXI program. In December the Army accepted seventeen such tanks. All were scheduled for operational testing at the NTC and the USMC base at Twenty-nine Palms, California. These tests would provide data comparing the servicability and maintenance requirements of the AIM tanks against non-rebuilt M1A1s. The AIM tanks were expected to fully vindicate the support given to the program, and its subsequent expansion to include 1000 tanks was also anticipated.⁶⁴

Fielding of the M1A2 proceeded on schedule in 1996. The tank remained in the production and deployment phase. The 1st Cavalry Division at Fort Hood, Texas, received deliveries of M1A2s for its component 1/8 CAV and 2/8 CAV. These deliveries were accompanied by a New Equipment Training Team (NETT) formed out of 16 CAV personnel at Fort Knox. Total M1A2s for the 1st Cavalry Division totalled 147 by the year's end. Other M1A2s already built included five pilot vehicles, ten prototype models, and sixty-two low rate initial production tanks. All of these vehicles found employment in training and experimentation. Production was to continue at the rate of 120 tanks per year until achievement of the goal of 1,079. In addition the production for Kuwait and Saudi Arabia neared completion with the former having accepted 118 of 218 purchased and the latter 300 of 315. Saudi Arabia further informally agreed to purchase an additional 150 M1A2s. The SEP entered its final stages of development with production scheduled to start in FY99. Within the Armor Center TSM Abrams led an ICT for those improvements to the M1A2 subsequent to the SEP. However, these high payoff upgrades suffered from research and development shortfalls that would delay their fielding cycles. Specific projects impacted included the Vehicle Integrated Defense System and target acquisition and fire control upgrades.⁶⁵

In September 1996 the Program Manager for Abrams Tank Systems completed its Test and Evaluation Master Plan for the M1A2. This document provided an overview of the tank and its development. It detailed the principal tests of the tank's performance to date and their outcomes. It also indicated the schedule and criteria for future operational testing and evaluation. Critical areas of operational capability included ensuring a superior combat effectiveness than the M1A1--including situational awareness and a higher kill rate--greater survivability, and operational viability. The last category addressed the vehicle's requirements for sustained field operations. The principal criterion focused upon the ability to integrate the tank into the existing support and force structure without increasing the operational demands over those of the M1A1.⁶⁶ The plan required \$18 million to complete tests by 1999.⁶⁷

Tests conducted through 1996 reflected the growing pains of the M1A2. The Early User Test and Experimentation conducted from August 1991 to January 1992 at Fort Hunter Liggett, California, did not show the tank as a great improvement over the M1A1, although comparable performance was achieved. This test used experienced tank crews who performed training, gunnery, and maneuver actions at the platoon level in both the M1A1 and M1A2. Software reliability inhibited effective use of the IVIS while

⁶⁴ General Dynamics Land Systems, "General Dynamics Wins AIM XXI Contract (July 12, 1996)," press release, internet source: <http://www.gdls.com/releases/pr960712-1.html>; General Dynamics Land Systems, "General Dynamics and Anniston Army Depot Complete First AIM XXI M1A1 Tank," December 5, 1996, press release, internet source: <http://www.gdls.com/releases/pr961205.html>; TSM Abrams, Input for 1996 Annual Command History, May 2, 1997.

⁶⁵ TSM Abrams, Input for 1996 Annual Command History, May 2, 1997; COL John F. Kalb, ATZK-TS (70), "1996 Annual Report of TRADOC System Manager for Abrams," August 19, 1996, included with TSM Abrams input for 1996 Annual Command History, May 2, 1997; TSM Abrams, Armor Fielding, briefing slides included with input for 1996 Annual Command History, May 2, 1997.

⁶⁶ PM Abrams Tank Systems, "Abrams M1A2 Test and Evaluation Master Plan," September 15, 1996, Appendix AA.

⁶⁷ PM Abrams Tank Systems, "Abrams M1A2 Test and Evaluation Master Plan," September 15, 1996, p. 69.

"immature" tactics, techniques, and procedures reduced tactical effectiveness. A subsequent customer test conducted at the NTC found that IVIS benefited platoon operations by reducing the response time to fragmentary orders.⁶⁸

From September to December 1993 the Operational Test and Evaluation Command (OPTEC) conducted the Initial Operational Test and Evaluation. This test evaluated the effectiveness of the M1A2 at the crew, platoon, and company/team levels. OPTEC's final report found the tank superior to the M1A1. Its digital components provided it with a more accurate picture of the battlefield. This enhanced situational awareness influenced navigation, movement, target acquisition, and hits registered. Its operational suitability was found to be similar to that of the M1A1, but its reliability remained too low for combat missions. Electronic problems accounted for this inferior performance. Several safety hazards were also experienced, including uncontrolled gun and turret movements and arbitrary firing of the .50 caliber gun, which led to the vehicle being declared unsafe.⁶⁹

A Follow on Test and Evaluation was conducted at Fort Hood in 1995. It consisted of new equipment training for elements of the 1st Cavalry Division in platoon gunnery and exercises. Uncontrolled gun and turret movements, however, resulted in the cessation of this test. Investigations followed to determine the cause of these movements, the .50 caliber firings, line replaceable unit contact burns, and data processing. A series of hardware and software changes occurred, followed by a second Follow on Test and Evaluation at Fort Hood in June and July 1996. This test included gunnery, road marches, and tactical maneuvers. The safety problems previously noted did not reoccur and the tank achieved overall results deemed satisfactory.⁷⁰

Gun and ammunition development for the Abrams fleet generally followed the recommendations of the ICT chartered by General Maggart after Armor Caucus I to study these areas. The findings of this ICT found incorporation into the Tank Modernization Plan. Gun tube tests focused upon accuracy improvements, while the XM 291 gun remained a developmental concept.⁷¹

The pursuit of smart tank munitions was considered an excellent investment by the Army Science Board. Through their use the effective range of the tank would be substantially increased. In 1996 development and testing of the STAFF round continued along a generally successful path. The modernization plan called only for the development of the round, not its fielding. Funding cuts, however, made even the realization of this goal problematic. At COL Kalb's request study began upon the requirements to complete development by 2006.⁷²

Although the modernization plan did not anticipate the development of an anti-personnel round, interest in acquiring one remained high. A consensus existed that the Abrams fleet required the ability to engage personnel targets with its main gun; an ability that had been lost when principal tank armament changed from the 105-mm to the 120-mm gun. Money to develop a new round remained nonexistent. One alternative studied included possible adoption of an existing Israeli round designed for the 120-mm gun carried on the Merkava series of main battle tanks that fired either Israeli or American-built ammunition. The ICT also studied the viability of modifying 105-mm munitions already in the U.S. Army's inventory.⁷³

⁶⁸ PM Abrams Tank Systems, "Abrams M1A2 Test and Evaluation Master Plan," September 15, 1996, pp. 59-61.

⁶⁹ PM Abrams Tank Systems, "Abrams M1A2 Test and Evaluation Master Plan," September 15, 1996, pp. 61-62.

⁷⁰ PM Abrams Tank Systems, "Abrams M1A2 Test and Evaluation Master Plan," September 15, 1996, pp. 4-8, 62-64.

⁷¹ TSM Abrams, Input for 1996 Annual Command History, May 2, 1997.

⁷² TSM Abrams, Input for 1996 Annual Command History, May 2, 1997; Panel discussion on Future Mounted Systems at American Defense Preparedness Association's Combat Vehicles Conference, September 24-26, 1996.

⁷³ TSM Abrams, Input for 1996 Annual Command History, May 2, 1997; Samuel M. Katz, Fire and Steel: Israel's 7th Armored Brigade (New York: Pocket Books, 1996), pp. 267-268; Samuel Katz and Peter Sarson, Merkava Main Battle Tank 1977-1996 (London: Reed International Books Ltd, 1997), p. 38.

A related requirement emerged with the withdrawal of the last M728 Combat Engineer Vehicle. Designed for breaching operations this tank was a modified M60 capable of mounting a variety of engineering equipment for mine or earth removal. It also carried a 165-mm gun intended to destroy fortifications at close range. The removal of these tanks resulted in the loss of its bunker-busting capability in a potential combat theater. To find a replacement the Army Materiel Command began a study at Aberdeen Proving Ground to see if a bunker-busting round could be developed for the 120-mm gun.⁷⁴

Future Scout and Cavalry System

One of the critical areas facing the Mounted Force in the future lay in scout vehicle modernization. In January 1996, following Armor Caucus I, General Maggart chartered an ICT within DFD to study this issue. Through March this ICT studied the viability and need for a purpose-built scout vehicle. It also reviewed alternative concepts that included evolutionary development of the BFV, modifying other vehicles to better fulfil the scout mission, and the adoption of a foreign-built vehicle.⁷⁵

The armor community favored development of a dedicated scout vehicle, and in November the ICT completed a mission needs statement for the Future Scout and Cavalry System (FSCS). Its designation reflected the broad range of activities that would be performed throughout the Mounted Force. The need for FSCS derived from problems with existing scout platforms. The principal vehicles employed in a scout role suffered from several deficiencies, and none were purpose-built. The BFV had evolved as an infantry squad carrier to replace the M113 Armored Personnel Carrier and lacked the low silhouette considered desirable for reconnaissance and surveillance operations. Both the HMMWV and the LAV-25 lacked sufficient mobility and protection against most forms of attack. None of these platforms appeared viable amid emerging threat technologies.⁷⁶ RAND studies of scout operations at the NTC in the 1980s and 1990s consistently indicated casualty rates of 50% among scouts and a direct link between the failure of recon operations and general mission failure for a command. Scouts required a stealthy, survivable platform that would increase their ability to acquire information from the battlefield.⁷⁷

The mission needs statement identified principal characteristics of the FSCS. It had to possess superior mobility and speed to other Maneuver Force elements, since its intended missions required to screen and remain in the van of tactical formations. Its weight had to permit transport by C-130, C-141, C-5, and C-17 aircraft. In addition it had to be free from highway and railroad constraints and remain capable of helicopter transport and low velocity air drops. A swim capability was necessary to avoid dependence upon bridge availability. Its crew was not to exceed three, and the FSCS had to require a minimum of logistical support. Its lethality and survivability were to include a full range of active and passive measures that incorporated the latest technological developments. It would equip reconnaissance platoons and would have to be capable of digital connectivity with all command echelons. In short the FSCS would have to be a revolutionary vehicle fully capable of performing Cavalry missions on the nonlinear battlefield independently or in conjunction with the Abrams tank and the planned FCS.⁷⁸

The FSCS ICT began to develop funding plans for the new vehicle. In the summer and fall of 1996, however, the possibility of a joint program with the United Kingdom caused major modifications to these

⁷⁴ TSM Abrams, Input for 1996 Annual Command History, May 2, 1997.

⁷⁵ DFD, Input for 1996 Annual Command History, Systems Division, Tab A; MG Lon E. Maggart, Charter for FSCS ICT, January 18, 1996, included with DFD input for 1996 Annual Command History, Systems Division, Tab A/1.

⁷⁶ BG (P) Joseph K. Kellogg, Jr., ATCD-MM (70), "Future Scout and Cavalry System Mission Need Statement," November 4, 1996, included with DFD input for 1996 Annual Command History, Systems Division, Tab A/3.

⁷⁷ DFD, Brief to Deputy Commanding General BG Clay Melton, notes and slides, January 8, 1997.

⁷⁸ BG (P) Joseph K. Kellogg, Jr., ATCD-MM (70), "Future Scout and Cavalry System Mission Need Statement," November 4, 1996, included with DFD input for 1996 Annual Command History, Systems Division, Tab A/3.

plans. In regular discussions between the British and American Armies, it became clear that both nations were planning development of a scout vehicle to meet similar needs and perform similar missions. In effect both countries had decided to build a nearly identical vehicle and began to explore the viability of a joint project.⁷⁹ On October 11, 1996 the two armies signed a statement of intent, indicating their willingness to merge their separate programs into one. Further exchanges led to the establishment of US/UK working groups and meetings between combat developers from each country. These efforts aimed at resolving differences between the development and acquisition processes of each nation, the extent of technology sharing that would occur, and completion of a draft cooperative operational requirements document by January 1997.⁸⁰

American efforts to build combat vehicles in cooperation with other countries had generally failed in the past, most notably with the MBT 70 program. Repeated efforts in the 1960s and 1970s by the British and Americans to build a joint reconnaissance vehicle never materialized. However, several factors suggested that FSCS development might prove more successful. Neither country could afford to develop a new scout vehicle alone. Cooperation would generate a cost savings to both nations and provide a broader base of technology options to incorporate into the vehicle. Both nations also independently identified common basic capabilities: detect and identify targets at 10+ kilometers, reduced signature, cross-country speed of 60 miles per hour, 400-mile range, and the ability to operate 72 hours without resupply.⁸¹ The success of ongoing cooperative planning also augured well for finalizing a partnership.

Battle Command

Digital operations on the battlefield required weapon systems and command echelons capable of digital communications. The vision of the future battlefield included a broadening of the channels of communication. Instead of the traditional vertical channels that paralleled command structures, the Army sought to permit communication across commands. The key to achieving this horizontal linkage lay in adapting the unlimited information links of the internet to the battlefield. The value of such a network of information conduits lay in the ability to share real-time and near real-time information concerning the tactical situation among all combat units. Digital technology held the promise of automating much of this information sharing and displaying it in a graphical manner that permitted rapid assessments of the situation and correspondingly faster reactions.

In achieving this vision, the Armor Center bore responsibility for development of a tactical internet to link all elements within the brigade. Known as Force XXI Battle Command Brigade and Below (FBCB2), this project aimed at establishing a common view of the battlefield among all brigade elements. In turn this commonality would enhance the synergistic effect of the combined arms team and permit a significant increase in the tempo of operations. It would also simplify through automation time-intensive tasks such as reporting positions, indicating supply status, and resupply. It required digitally linking all platforms in the brigade, regardless of parent organization. The brigade internet also had to be capable of seamless interaction with similar nets developed for higher command echelons.⁸²

In October 1993 TRADOC approved a mission needs statement for development of FBCB2. In 1994 the Armor Center developed an operational requirements document and distributed throughout Army commands worldwide. After incorporating recommended changes the document was submitted to TRADOC in January 1995 for approval. TRADOC approved it and submitted it to DA for final action in

⁷⁹ DFD, Input for 1996 Annual Command History, Systems Division, Tab A.

⁸⁰ "US Future Scout and Cavalry System and UK Tactical Reconnaissance Armored Combat Equipment Requirement: Cooperative Program Review," briefing slides included with DFD input for 1996 Annual Command History, Systems Division, Tab A/4.

⁸¹ "US Future Scout and Cavalry System and UK Tactical Reconnaissance Armored Combat Equipment Requirement: Cooperative Program Review," briefing slides included with DFD input for 1996 Annual Command History, Systems Division, Tab A/4; Christopher T. Heun, "Army and Abrams Tank Linked for the Long Haul," National Defense, LXXXI, 522 (November 1996) 20-22.

⁸² DFD, Brief to Army Digitization Officer BG Caldwell, notes and slides, August 2, 1996.

March. There it remained for over sixteen months with no action. Partial explanation for this delay lay in the emergence of questions about the document's utility based upon Army-wide digitization efforts. The operational requirements document, however, represented the views of field commands concerning their needs. For much of the year the document remained unsigned and DA endorsement of FBCB2 appeared to be indefinitely on hold.⁸³

Other problems also confronted FBCB2. It represented an end state not yet realizable in 1996. Army digitization efforts previously had lacked central coordination. Each branch pursued its own separate path of development. Consequently, attempts to establish a tactical internet that crossed branch and command boundaries foundered upon the variety of computer systems and protocols in use Army-wide. The Army's earlier stovepiped approach to digital communications ensured that platforms and command organizations could not communicate with one another. The Army's Appliqué program represented an interim solution that focused upon improvised links. Its principal lay in enabling the EXFOR to conduct digital operations, but it was considered in an "immature" state of development. At its best performance, however, Appliqué software proved capable of only performing 51% of the functions required for the FBCB2. Normal performance accomplished only 25%. Concerns existed lest it prove a failure in the upcoming AWE in 1997 and destroy the credibility of the Army's digitization efforts.⁸⁴

The embryonic state of the tactical internet resulted in unacceptable restrictions upon tactical operations. EXFOR elements found that every change in a tactical organization required a complete reconfiguration of the digital network. All affected platforms had to go off-line for up to forty-eight hours. Thus combined arms forces changing their task organization to meet changing battlefield situations encountered a prohibitive delay that made them less effective than a similar force using conventional communications. A further obstruction occurred when voice and digital signals crossed and effectively cancelled one another. Imposing time and system restrictions on transmissions provided a workaround but further negated the value of digital communications. Senior commanders could not send digital operational orders direct to battalion commanders, instead having to rely upon a relay system that slowed transmission and receipt of the order. Such problems, however, were considered temporary and part of a painful teething process that would not continue indefinitely. Moreover, the decision to accelerate the AWE process to maximize its influence upon budget planning created an imperative to find solutions to such problems rapidly.⁸⁵

Command and Control Vehicle

Army preparations for the digital battlefield also included development of a new command vehicle intended to provide enhanced communications ability and protection to forward command posts. The need for such a vehicle emerged from analysis of the Gulf War. There the M577 was considered to be deficient in its mobility and survivability. The small vehicle did not accommodate effective operations on the move. Instead it had to be stationary and a tent extension set up so that command functions could be performed outside the vehicle. Such an arrangement offered minimal protection to all forms of attack. Nor did it suit the high operational tempo expected of the digital battlefield that emphasized the importance of constant movement. In 1991 the Armor Center identified the M577 as inadequate for its task. A 1992 GAO report confirmed this assessment and recommended the vehicle's replacement.⁸⁶

Development began on a new platform known as the command and control vehicle, or "C2V." It was intended to replace M577 command post carriers in battalion through corps headquarters in heavy maneuver units. Built on a fully enclosed multiple launch rocket system (MLRS) chassis, the planned

⁸³ DFD, Brief to Army Digitization Officer BG Caldwell, notes and slides, August 2, 1996; DFD, Input for 1996 Annual Command History, Systems Division; MMBL, Overview briefing given to Dr. Robert S. Cameron, August 23, 1996.

⁸⁴ DFD, Brief to Army Digitization Officer BG Caldwell, notes and slides, August 2, 1996; DFD, Brief to Deputy Commanding General BG Clay Melton, notes and slides, January 8, 1997.

⁸⁵ DFD, Brief to Army Digitization Officer BG Caldwell, notes and slides, August 2, 1996.

⁸⁶ DFD, Brief to Army Digitization Officer BG Caldwell, notes and slides, August 2, 1996.

vehicle offered better mobility, NBC protection, POS/NAV similar to that found on the M1A2 tank, and the ability to operate on the move. Unlike the M577, it could keep pace with the Abrams/Bradley team. It also carried an array of communications equipment intended to interface with digital systems in the tactical internet. Its interior layout included four digital workstations. When stationary, a ten-meter telescoping mast permitted a rapid increase in line-of-sight based communications. C2V fielding would begin in 1999.⁸⁷

For much of 1996, however, the C2V's fate remained unsettled. The program's six-year spending plan covered the period from 1998-2003, but Army budget planners considered the program a potential billpayer for other costs and removed \$370 million from the last two years of the program. They expected to restore the funds subsequently. Congress then removed another \$10 million from the programs FY97 budget, despite Army protests cutting funding so early in a project's development process would destabilize it. Together these cuts threatened to stop all current production plans. They also promoted uncertainty about the program's future, and it began to be considered for termination. The program was due to be renewed, but in its reduced funding state could not secure approval for continuation.⁸⁸

The Army decided to sustain the program. It restored its earlier cut to the program's funding, effectively removing the C2V from its list of potential billpayers. Congress also reversed itself and restored the \$10 million previously taken from the program. In September the C2V received approval to enter Low Rate Initial Production with a total of 46 vehicles to be built between FY97 and FY00 by UDLP in York, Pennsylvania. The ability of the vehicle to demonstrate its potential to meet performance standards and user requirements during tests conducted during the year proved a major influence in securing the program's future.⁸⁹ Further development was required to determine the optimum internal configuration of the C2V. In addition the C2V became integrated with ongoing efforts to redesign the Tactical Operations Center for the digital battlefield. The MMBL planned to run tests comparing the current staff operations using M577s against similar activities with C2Vs. The Armor Center bore primary responsibility for both initiatives.⁹⁰

Organizational Development

In addition to matériel development the Armor Center also participated in the evolution of related organizations. This organizational activity directly supported Force XXI efforts to revise its force structure to meet national strategy. DFD's Organizations Division studied organizational concepts that would impact upon armor and cavalry units through the brigade level. It also wargamed new concepts and analyzed current and expected threat developments. The results of these and related studies helped determine what new capabilities would be required in the future and how they would be integrated into unit organizations. Its study of Dominating Maneuver, for example, sought to identify new operational and organizational concepts that might fundamentally alter battlefield operations through workshop analysis and wargames. While this project supported the Army After Next, the Mounted Close Combat Battalion Concept evaluated the impact of new technologies at the battalion level, including fielding of the TERM round, FSCS, and improvements to the M1A2 beyond the SEP. Cavalry organizations benefited from efforts to enhance the capabilities of the cavalry squadrons assigned to the light divisions. The recommended organization sought to enable the conduct of continuous, all weather operations with sufficient ground, recon, and organic logistics capabilities.⁹¹

⁸⁷ "Command and Control Vehicle," *Army*, 46, 10 (October 1996) 271; DFD, Input for 1996 Annual Command History, Systems Division.

⁸⁸ "Army Cuts Out-Year C2V Money by \$370 Million; Lawmakers Slice '97 Funds," *Inside the Army*, June 10, 1996, pp. 1, 13-14; Daniel G. Dupont, "Army May Be Moved To Terminate Another Program to Pay Mounting Bills," *Inside the Army*, August 26, 1996, pp. 1, 8-9.

⁸⁹ Jason Sherman, "Command and Control Vehicle Approved for Low-Rate Initial Production," *Inside the Army*, September 30, 1996, pp. 1, 6; DFD, Input for 1996 Annual Command History, Systems Division.

⁹⁰ DFD, Input for 1996 Annual Command History, Systems Division.

⁹¹ DFD, Brief to Deputy Commanding General BG Clay Melton, notes and slides 12, 14, 19, January 8, 1997.

Such conceptual analysis provided input for the Total Army Analysis and Functional Area Assessment processes. The Total Army Analysis determined the Army's requirements several years in advance and linked these needs to a funding plan. In 1996 the TAA process addressed needs for the year 2005. One concern of the Armor Branch lay in retention of the light armor battalions within the Light Infantry Division structure. The Functional Area Assessment represented a biennial branch review ultimately given to the Vice Chief of Staff of the Army. It encompassed doctrine, training, leadership, organization, and manpower concerns within a branch. Because of its breadth, the Functional Area Assessment tended to provide a sensing of a branch's health and vitality.⁹²

DFD also conducted studies of organizations for incorporation into the EXFOR at the brigade and below levels. It also reviewed changes implemented by the EXFOR and their relation to current armor and cavalry units. The EXFOR division structure approved for experimentation purposes removed all combat service support elements from the tank battalions and pooled them at the divisional level. Tank battalions also lost their supporting mortar platoons, and the division's overall ability to support tank operations suffered from the reduction of the engineer brigade to two engineer battalions. Divisional cavalry squadrons gained an NBC reconnaissance unit. The Brigade Reconnaissance Troop also underwent restructuring to comprise two HMMWV-equipped scout platoons. The 3d Brigade, 4th Infantry Division incorporated to incorporate this unit prior to employing it at the NTC.⁹³

The Organizations Division of DFD prepared threat and intelligence assessments for the armor community. It prepared background briefings on operations in Bosnia intended to keep the Armor Center's senior leadership informed of events and potential threats to American forces there. It also opened a home page for information on the military capabilities of foreign powers, including for example a description of the new T-84 fielded by the Ukraine. It published and distributed online a regular summary of principal political and military events worldwide. The division's Threat Manager was appointed to head the gun and ammunition ICT for tank modernization. His principal responsibility lay in examining deficiencies in currently fielded and projected ammunition. The ICT developed solutions for these problems and incorporated them into program plans for new ammunition.⁹⁴

⁹² DFD, Brief to Deputy Commanding General BG Clay Melton, notes and slides 22-26, January 8, 1997.

⁹³ DFD, Input for 1996 Annual Command History, Organizations Division.

⁹⁴ DFD, Input for 1996 Annual Command History, Organizations Division.

ACRONYMS

ACRONYM

TERM

A-FIST	Abrams Full Crew Interactive Simulation Trainer
AAN	Army After Next
AAR	after-action review
ABC	activity based costing
ABMS	Assault Breach Marking System
AC	active component
ACAP	Army Career and Alumni Program
ACES	Army Community Education System
ACOE	Army Communities of Excellence (ACOE) Award Program
ACIPS	Army Casualty Information Processing System
ACS	Army Community Services
AFATDS	Advanced Field Artillery Tactical Data System
AFGE	American Federation of Government Employees
AFTB	Army Family Team Building
AG	Adjutant General
AGS	Armored Gun System
AGTS	Advanced Gunnery Training System
AIT	advanced individual training
AIT	automated information technology
ALB	AirLand Battle
ALC	Army Learning Center
ANCOC	advanced noncommissioned officer course
AOAC	Armor officer advanced course
AOBC	Armor officer basic course
APIC	Army Performance Improvement Criteria
ARI	U.S. Army Research Institute for the Behavioral and Social Sciences
ARNG	Army National Guard
ARPA	Advanced Research Projects Agency
ARSPACE-FWD	Army Space Command (Forward)
ARTEP	Army Training and Evaluation Program
ASAS	All-Source Analysis System
ASAT	Automated Systems Approach to Training
ASQC	American Society for Quality Control
AT	annual training--reserve training
ATB	Armored training brigade
AUSA	Association of the United States Army
AWE	advanced warfighting experiments
AWWG	Advanced Warfighting Working Group
B2C2	Brigade and Below Command and Control
BASOPS	base operations
BCBL	Battle Command Battle Laboratory, Fort Leavenworth
BCIS	Battlefield Combat Information System
BCT	basic combat training
BCV	battle command vehicle
BDM	Braddock, Dunn, and McDonald Corporation
BFIST	Bradley Fire Support Vehicle XM7
BFV	Bradley fighting vehicle (M2)
BICC	Battlefield Intelligence Coordination Center

BLEP	Battle Lab Experiment Plan
BMOC	Battalion Maintenance Officer Course
BN/TF	battalion/task force
BNCOC	Basic Noncommissioned Officer Course
BOS	battlefield operating systems--Intelligence, Maneuver, Fire Support, Mobility/countermobility/survivability, Air Defense, Combat Service Support, and Command and Control (C2)
BRAC	Base Realignment and Closure
BSD	Battlefield Synchronization Demonstration
BSFV-E	Bradley Stinger Fighting Vehicle-Enhanced
BUR	Bottom-Up Review
C2	command and control
C2V	command and control vehicle
CATT	Combined Arms Tactical Trainer
CBRS	concept-based requirements system
CCIR	critical combat information requirements
CCTT	Close Combat Tactical Trainer
CECOM	U.S. Army Communications-Electronics Command
CEOG	Commander, Experimental Operations Group [AWE FD]
CEP	Concept Evaluation Proposals (sub-program of Advanced Technology Demonstration (ATD) program
CFF	call for fire
CFV	cavalry fighting vehicle (M3)
CJCS	Chairman, Joint Chiefs of Staff
CMTC	combat maneuver training center
COFT	Conduct of Fire Trainer
COLT	company lazng team
CONUS	Continental United States
CPMC	capital purchase and minor construction
CPAC	Civilian Personnel Advisory Center
CPO	Civilian Personnel Office
CPOC	Civilian Personnel Operations Center
CPX	command post exercise
CRM	Cultural Resource Manager
CRP	combat reconnaissance patrol
CSA	Chief of Staff of the Army
CTC	combat training center
CTCP	combat trains command post
CUXXI	Combat Unit XXI
CVC	Combat Vehicle Crewman
DA	Department of Army
DARPA	Defense Advanced Research Projects Agency
DAS	Director, Armor School
DBO	Directorate of Business Operations
DCD	Directorate of Combat Development
DCFA	Directorate of Community and Family Activities
DCG	Deputy Commanding General
DCSPER	Deputy Chief of Staff for Personnel
DFAS	Defense Finance and Accounting Service
DFD	Directorate of Force Development
DHR	Directorate of Human Resources
DIS	distributed interactive simulation
DOC	Directorate of Contracting
DOD	Department of Defense

DOIM	Directorate of Information Management
DOL	Directorate of Logistics
DPTM	Directorate of Plans, Training, and Mobilization
DPW	Directorate of Public Works
DRM	Directorate of Resource Management
DTDD	Directorate of Training and Doctrine Development
DTLOMS	doctrine, training, leaders, organization, materiel, and soldierization
ECAR	Environment Compliance Assessment Report
ECAS	Environment Compliance Assessment System
EEO	Equal Employment Opportunity
EMD	Environmental Management Division
EMFCS	Enhanced Mortar Fire Control System
EO	Equal Opportunity
E-PLGR	Enhanced Precision Lightweight Global Positioning System Receivers
EQCC	Environmental Quality Control Committee
ESC	executive steering committee
EXFOR	experimental force
FARP	forward area resupply point
FARV	Future Armored Resupply Vehicle
FBCB2	Force XXI Battle Command--Brigade and Below
FCS	Future Combat System
FDC	field data collector
FDC	fire direction center
FER	force exchange ratios
FIST	fire support team
FLIR	Forward Looking Infrared
FMBT	Future Main Battle Tank
FMSTO	Foreign Military Sales Training Office
FO	forward observer
FOG	Future Operations Group, 1 ATB
FORSCOM	U.S. Army Forces Command
FRAGO	fragmentary order
FSCS	Future Scout and Cavalry System
FSE	fire support element
FSE	forward security element
FSV	fire support vehicle (M981)
FTX	field training exercise
FUE	First Unit Equipped
GAO	Government Accounting Office
G3/DPTM	G3/Directorate of Plans, Training, and Mobilization
G4/DOL	G4/Directorate of Logistics
GCCS	Global Command and Control System
GCSS	Global Combat Support System
GDLS	General Dynamics Land Systems
HAZMAT	hazardous materials
HHT	Headquarters and Headquarters Troop
HL-UAV	Hand Launched Unmanned Aerial Vehicle
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HQDA	Headquarters, Department of the Army
HUD	Horizontal Unit Displacement
ICT	integrated concept team
IDT	inactive duty training--reserve training

IET	initial entry training
IFSAS	Initial Fire Support Automated System
IMF	Intelligent Minefield
IMILES	Improved Multiple Integrated Laser Engagement System
IOT&E	initial operations test and evaluation
ISM	Installation Support Module
ITV	in-transit visibility
IVIS	Intervehicular Information System
JMRR	Joint monthly readiness review
JROC	Joint Required Operational Capability
JROTC	Junior Reserve Officer Training Corps
JRTC	Joint Readiness Training Center, Fort Polk, LA
JSR	Joint Strategic Review
JTAV	Joint Total Asset Visibility
JV2010	Joint Vision 2010
LAM	Louisiana Maneuvers
LAN	local area network
LAV	light armored vehicle
LEC	Law Enforcement Command
LER	loss exchange ratios
LIVID	live-to-virtual interface devices
MBBL	Mounted Battlespace Battle Laboratory, Fort Knox
MCOFT	Mobile Conduct of Fire Trainer
MDR	milestone decision review
MEDDAC	Medical and Dental Activity
METL	mission essential task list
METT-T	mission, enemy, terrain, troops, and time available
MHEP	military history education program
MILES	Multiple Integrated Laser Engagement System
MLRS	Multiple Launch Rocket System
MMBL	Mounted Maneuver Battle Lab
MMDL	multimedia distance learning
MNS	Mission Need Statement
ModSAF	Modular Semi-Automated Forces
MOS	Military Occupational Specialty
MOU	memorandum of understanding
MOUT	military operations on urbanized terrain
MP	Military Police
MPRC	multi-purpose range complex
MRB	motorized rifle battaion
MTP	mission training plan (usually with ARTEP)
MTS	Movement Tracking System
MWBL	Mounted Warfighting Battle Lab
MWR	morale, welfare, and recreation
MWSTC	Mounted Warfare Simulation Training Center, Fort Knox
MWTB	Mounted Warfare Test Bed, Fort Knox
NATO	North Atlantic Treaty Organization
NBC	nuclear, biological, chemical
NCOA	Noncommissioned Officers Academy
NET	New Equipment Training
NETT	new equipment training team
NG	National Guard
NMS	National Military Strategy
NIST	National Institute for Standards and Technology

NPR	National Performance Review
NTC	National Training Center, Fort Irwin, CA
O/C	observer-controller
OCOIA	Office of the Chief of Armor
OCONUS	outside the Continental United States
ODS	Operation Desert Storm
OGC	Office of the Garrison Commander
OMBI	Office of Mounted Battlespace Integration
OOTW	operations other than war
OPFOR	opposing force(s)
OPTEC	Operational Test and Evaluation Command
OSACG	Office of the Special Assistant to the Commanding General
OSD	Office of the Secretary of Defense
OSUT	one station unit training
PA	physician assistant
PAO	Public Affairs Office
PCC	Pre-Command Course
PERSCOM	Total Army Personnel Command
PGS	Precision Gunnery Simulation (PGS)--Bradley series
PO&T	Plans, Operations, and Training
POC	platoon operations center
POC	point of contact
POI	program of instruction
PRIME	Pre-RIF Initiatives for Management and Employees
QDR	Quadrennial Defense Review
QMB	quality management board
QOL	Quality of Life
QWB	quality workforce board
RAM	Reliability, Availability, Maintainability
RC	reserve component
RCF	Regional Corrections Facility
RCSC	Reinvention Center Steering Committee [TRADOC]
RCSD	Reserve Component Support Division
RCVTP	Reserve Component Virtual Training Program
RD&A	research, development, and acquisition
RDA	research, development, and acquisition
RDT&E	research, development, test, and evaluation
REFORGER	Return of Forces to Germany (exercise series)
RORO	roll-on, roll-off ship
ROTC	Reserve Officer Training Corp
RTO	radio telephone operator
SAB	separate armored brigade
SAF	semi-automated forces—simulation
SATS	Standard Army Training System
SBC	Service Based Costing
SCCC	Scout Commander Certification Course
SEP	System Enhancement Package
SHPO	State Historic Preservation Office
SHTU	Simplified Handheld Terminal Unit
SIDPERS	Standard Installation/Division Personnel System
SIMITAR	Simulations in Advanced Training Readiness
SIMNET	Simulation Networking
SIMUTA	Simulation-based Unit Training for Armor Units
SINCGARS	Single Channel Ground and Airborne Radio System

SJA	Staff Judge Advocate
SME	subject matter expert
SOLMC	Senior Officer Logistics Management Course
SOP	standard operating procedures
SPAN	Security Policy Automation Network
SPLC	Scout Platoon Leaders Course
SPMK	Scout Platoon Modification Kit
SRE	Single Channel Ground and Airborne Radio System (SINCGARS) Radio Emulator
SRM	Single Channel Ground and Airborne Radio System (SINCGARS) Radio Model
ST	special text
STACC	Short Term Alternate Child Care
STAFF	Smart target-activated fire and forget
STOW	Synthetic Theater of War
STRAPS	system training plans
STRICOM	U.S. Army Simulation, Training, and Instrumentation Command
STRONGARM	Strategies for Training and Assessing Armor Commanders' Performances with Devices and Simulations
TAA	Total Army Analysis
TAC CP	tactical command post
TAPES	Total Army Performance Evaluation System
TAQ	Total Army Quality
TASS	Total Army School System
TATS	Total Army Training System
TCCAT	Third Class Combined Arms Training
TCCC	Tank Commander Certification Course
TDA	table of distribution and allowance--staffing document for the institutional, as opposed to operational, Army
TDS	Tank Driver Simulator
TECO	Test and Evaluation Coordinating Office
TEM/OPS	Terrain Evaluation Model/Obstacle Planning System
TERM	Tank Extended Range Munition
TEXCOM	Test and Experimentation Command
TF	Task Force
TF XXI AWE	Task Force XXI AWE
THP	take-home package
TISA	Troop Issue Support Activities
TOC	tactical operations center
TOE	table of organization and equipment-
TOW	Tube-Launched Optically Tracked Wire-Guided [missile]
TQM	Total Quality Management
TRAC-WSMR	TRADOC Analysis Command, White Sands Missile Range
TRADOC	U.S. Army Training and Doctrine Command, Fort Monroe, VA
TSARC	test schedule and review committee
TSC	Training Support Center
TSI	Technical Solutions Incorporated
TSM	TRADOC systems manager
TSV	Thru-Sight Video
TTP	tactics, techniques and procedures
TWGSS	Tank Weapons Gunnery Simulation System (TWGSS)--M1 series
UAAPU	Under-Armor Auxiliary Power Unit
UAHMMWV	Up-Armored High Mobility Multipurpose Wheeled Vehicle

UAV	unmanned aerial vehicle
U-COFT	Unit Conduct of Fire Trainer
UFR	Unfinanced Requirement
ULDP	United Defense Limited Partnership
ULP	Unfair Labor Practice
USAARMC	United States Army Armor Center
USAARMS	United States Army Armor School
USAIS	United States Army Infantry School
USAR	United States Army Reserve
USAREC	United States Army Recruiting Command
USATEC	U.S. Army Topographical Engineering Center
USMA	U.S. Military Academy, West Point
USMC	U.S. Marine Corps
VDCPADS	Vehicular Data Communications and Positional Awareness Demonstration
VERA	Voluntary Early Retirement Authority
VIDS	Vehicle Integrated Defense System
VIVID	virtual-to-virtual interface devices
VSI	Voluntary Separation Incentive
VTC	videoteleconference
VTP	Virtual Training Program
WAM	Wide Area Minefield
WKTA	Western Kentucky Training Area
WRAP	Warfighting Rapid Acquisition Program

INDEX

A

Aberdeen Proving Grounds, 17, 54, 86, 127
Abrams Auditorium, 85
ACIPS, 44
acquisition
 cycle, 14, 110, 122
 reform, 11, 14, 17, 110, 111
Acquisition Reform Act, 110
Active Component, 36, 37, 44, 47, 49, 51, 67, 70, 71, 72, 73, 74, 75, 76, 78, 79, 80, 81
Activity Based Costing, 19, 25, 31, 42
Adjutant General, 37, 44, 73
Advanced Individual Training, 80
Advanced NCO Course for Armor Crewman and Cavalry Scout, 71
Advanced Noncommissioned Officer Course, 81
Advanced Warfighting Experiment, 8, 11, 14, 65, 66, 90, 107, 108, 117, 121, 129
Advanced Warfighting Working Group, 28, 34, 90
AIM XXI, 116, 125
Alabama, 37, 46, 71
American Federation of Government Employees, 30
Anderson Complex, 46
Anderson Covered Pool, 60
Andrysiak, Peter, 32, 38
Appliqué, 117, 129
Armor, 1, 2, 4, 7, 8, 12, 16, 17, 29, 91, 94, 130
 Caucus, 16
 Caucus I, 112, 113, 114, 120, 126, 127
 Caucus II, 113, 114, 120
 Conference, 113
 Functional Area Assessment, 72
 Magazine, 91, 93
 Officer Advanced Course, 70, 80, 92
 Officer Basic Course, 49, 80
 Research Center, 70
 School, 23, 25-26, 30, 33, 38, 40, 65, 70, 71, 77, 79, 80, 81, 83, 84, 87, 90, 121
 Command and Staff Department, 90
 Director, 30, 38
 Library, 71
 Staff and Faculty Development Branch, 70
Armor Inn, 60, 61
Armor Inn Bingo Program, 60
Armored Gun System, 16, 17, 111
Armored Forces Research Unit of the U.S. Army, 77
Army After Next, 8, 94, 119, 130
Army Vision 2010, 15, 16, 107
Army XXI, 14, 108
ARTEP 71-3 MTP (Initial Draft) Mission Training Plan for the Heavy Brigade Command Group and Staff, 93
Assistant Secretary of Defense for Manpower and Reserve Affairs, 17
Automated Systems Approach to Training Integration, 93
automation, 4, 15, 36, 44, 64, 70

B

- Baldrige, Malcolm, 29-30
 - Award, 29
- Barr Memorial Library, 30
- Base Realignment and Closure Commission, 4, 109
- Basic Combat Training, 74, 80, 81
- Basic Maintenance Course, 86
- Basic Noncommissioned Officer Course, 81
- BASOPS, 11, 14, 19, 25, 27, 29, 30, 35, 36, 37, 38
- BASOPS Leveraging and Development Grant, 33
- BASOPS Strategic Planning Group, 36
- Battalion Maintenance Officer Course, 80, 88, 92
- Battle Command, 99, 128
- Battle of 73 Easting, 98
- Battlefield Override, 80
- Baum Range, 84
- BBS, 65, 75, 76
- Berlin Wall, 73
- Better Opportunities For Single Soldiers, 46
- Black Capped Viero, 82
- Bosnia, 2, 17, 43, 85, 94, 100, 131
- Bosslift, 74
- Bottom-Up Review, 2, 16, 108
- Brick Mess, 60, 61
- Brigade and Below Simulations Training Program, 66
- Brigade Reconnaissance Troop, 97, 131
- Brown, Charlie, 61
- Bryla, COL Edward A., 25-27
- budget planning, 7, 11
- Building
 - 707, 48
 - 1002, 27
 - 1101, 27
 - 1109, 91
 - 2010, 91
 - 2369, 91
 - 2426, 91
 - 4401, 91
 - 5923, 81
 - 5936, 81

C

- Caddell Construction Company, 46
- Camp Challenge, 74
- Campaign 2001, 92
- Capital Purchase and Minor Construction, 60
- Carter, President Jimmy, 36
- Casualty and Mortuary Affairs Program, 44
- Casualty Area Command, 44
- Casualty Information Processing System, 44
- Cavalry
 - doctrine, 95

- Symposium, 97, 98, 99, 100, 101
- Cavalry Leaders Course, 69, 80
- CECOM, 122
- Cedar Creek Tank Gunnery Range, 84
- Center for Army Lessons Learned, 93
- Chandler, Ben, State Attorney General, 55
- Channel 12, 22
- Chief of Staff of the Army, 19, 21, 25, 26, 27, 29, 30, 80
- Civil Rights Act of 1991, 53
- Civilian Monument, 52
- Civilian Personnel
 - Advisory Center, 37, 51
 - Newsletter, 37, 38, 50, 51, 52
 - Office, 4, 37, 38, 50, 51, 52, 53
 - Operations Center, 37
- civilian workforce, 2, 4, 8, 12, 19-22, 27-33, 42, 44, 50, 51, 52, 53
- Classroom XXI, 23, 64, 69, 70, 92
- Clean Water Act, 57
- Clinton, President Bill, 17, 36, 45
- Close Combat Tactical Trainer, 65, 68, 69, 75, 92
- club system, 36, 50, 53, 61
- Cold War, 2, 4, 7, 12, 14, 44, 63, 71, 73, 94, 108, 109
- Combat Service Support, 69
- Combat Training Centers, 94, 97, 100
- Combined Arms Tactical Trainer, 68, 69
- Command and Control Vehicle, 11, 92, 129, 130
- Commander's Planning Group, 20, 21
- Community and Family Support Center, 48
- Community and Family Support Center and Civilian Personnel Policy Division, 47
- Computer Assisted Survey Program, 94
- Conduct of Fire Trainer, 75
- Continental United States, 12, 50, 63, 69, 76, 84
- contingency operations, 7, 8, 11, 17
- Contracting Opportunities Day, 43
- coordination meetings, 22
- Corcoran, Lockheed Martin Electronics President Thomas A., 110
- Cranston, Dr. John, 85
- Crittenberger Elementary School, 49
- Cultural Resource Manager, 85

D

- Decker, Assistant Secretary of the Army for Research, Development and Acquisition Gilbert F., 108
- Demand Side Management, 43
- Demien, Steven, Chaplain, 46
- Department of Army, 19, 37, 44, 46, 47, 48, 50, 52, 60, 73, 79, 81, 84, 85
 - Installation Support Module Program Office, 44
 - Installation Support Module Project Manager, 44
- Department of Defense, 37, 43, 49, 51, 57, 109, 110
 - Advanced Research Projects Agency, 77
 - budget, 4, 7, 11

Finance and Accounting Service, 53
 School System, 49
 Deputy Commanding General, 21, 26, 28, 30, 38, 66, 81, 82, 90, 92
 Desert Hammer VI, 8, 65, 95
 digitization, 2, 14, 16, 63, 64, 70, 79, 92, 103, 107, 111, 116, 117, 128, 129
 Directorate of Business Operations, 26-27, 32, 37, 38, 40, 43, 50, 53
 Directorate of Combat Developments, 121
 Directorate of Community and Family Affairs, 26-27, 37, 38, 42, 47, 49, 50, 59, 60, 61
 Teen Program Branch, 49
 Directorate of Contracting, 37, 57, 63, 64, 65, 66, 69, 70, 71, 75
 Directorate of Force Development, 90, 112, 121, 122, 127, 130
 Organizations Division, 130, 131
 Directorate of Human Resources, 26-27, 37, 38, 39, 50, 51, 52
 Directorate of Information Management, 22-23, 44
 Directorate of Logistics, 25, 27, 31-32, 37, 42, 43, 52, 57
 Maintenance Division, 25
 Transportation Scale House, 43
 Directorate of Plans, Training, and Mobilization, 26, 37, 58
 Continuing Education Services, 37
 Program Management Division, 26
 Directorate of Public Works, 25, 27, 37, 38, 42, 43, 45, 46, 52, 57, 58, 59
 Fish and Wildlife Section, 58
 Housing Division, 37, 38
 Supply and Storage Division, 37
 Directorate of Resource Management, 25, 26
 Directorate of Training and Doctrine Development, 26, 65, 66, 67, 78, 79, 90, 91, 93, 94, 101, 121
 Doctrine Division, 91
 Training Division, 91
 DIS, 123
 Distance Learning, 23, 64, 69, 70, 80
 Divisional Cavalry Squadron, 97
 Dominating Maneuver, 130
 downsizing, 2, 4, 7, 12, 43, 44, 50, 51, 52, 53, 54, 63, 64, 70, 71, 72, 79, 88
 Driver Trainer, 75
 Driver's Alert Panel, 79
 Driver's Instrument Panel, 79
 Driver's Integrated Display, 79
 Driver's Master Panel, 79
 Drug and Alcohol Management Information System, 44

E

Early User Test and Experimentation, 125
 Echo Company, 74
 Edmunson, Joe, 81
 Education Center's Education Management Information System, 44
 electromagnetic gun, 120, 123
 Elizabethtown Small Business Development Center, 43
 emergency dialing system, 55
 Emergency Protective Orders, 54
 Enhanced Precision Lightweight Global Positioning System Receivers, 80
 Environmental Quality Control Committee, 46, 57, 58, 59
 Entelechy, Inc., 93
 Equal Employment Opportunity, 44, 51, 52, 53, 54

Mentoring Program, 52
Equal Opportunity, 44, 45, 51, 52, 53, 54
Evaluations Section, 44
Executive Steering Committee, 30-31, 38, 42
 BASOPS, 38
 Futures, 38
 Training, 38
Experimental Force, 16, 34, 66, 79, 94, 95, 103, 107, 108, 129, 130

F

factfinder, 53
Family Force Forum, 49
FBCB2, 100, 128, 129
Field Artillery, 69
FM 17-12-1-1 & -2: Tank Combat Tables - M1 Volumes I and II, 103
FM 17-15, 93, 104
FM 17-15: Tank Platoon, 95, 104
FM 17-95, 99, 100
FM 17-95: Cavalry Operations, 95, 98, 99, 101
FM 71-1, 104
FM 71-1: Tank and Mechanized Company Team, 103
FM 71-3, 97
FM 90-3: Desert Operations, 103
Focused Dispatch, 8, 16, 65, 66, 86, 95, 117, 122
Fogleman, Malcolm, 30
Force XXI, 2, 4, 8, 11, 12, 14-17, 19, 21, 28, 33, 34, 63, 64, 65, 66, 67, 68, 73, 94-98, 100, 101, 103, 108, 112, 114, 123, 130
 Campaign Plan, 19
 Training Program, 33, 65-68, 75, 78, 92
Foreign Military Sales Training Office, 87, 88, 40
FORSCOM, 30, 112
Fort Benjamin Harrison, 33, 53
Fort Benning, 14, 26
Fort Bliss, 82
Fort Campbell, 43
Fort Carson, 86
Fort Hood, 8, 16, 66, 69, 79, 80, 82, 94, 95, 103, 108, 125, 126
Fort Hunter Liggett, 125
Fort Knox, 2, 4, 7, 8, 12, 16, 19-23, 25-30, 33, 36-38, 43-48, 55-60, 64-66, 67-70, 73, 80-82, 88, 92, 97, 101, 103, 113, 125
 Claims Office, 55
 Community Schools, 49
 Doctrine Home Page, 93
 Examiner Team, 31
 Excellence Pin, 28
 Game Wardens, 55
 Labor Management Agreement, 30, 38
 Labor Management Partnership, 51-53
 Labor Management Partnership Council, 38, 53
 Leadership Association, 52
 Partnership Council, 30, 38
Fort Leonard Wood, 92

fratricide, 101, 104
Functional Area Assessment, 130
Future Combat System, 16, 112, 113, 114, 119, 120, 127
Future Ground Combat Systems Office, 14
Future Scout and Cavalry Vehicle, 102, 112, 120, 127, 128, 130
Future Main Battle Tank, 120

G

Garrison Command, 30, 33, 36, 37, 38, 48, 60
Garrison Commander, 30
Geier, COL Richard, 33
General Dynamics Land Systems, 125
Georgia, 76, 78
Gilmore, Nancy, 32, 52
Godman Airfield, 85
Golden Field Day, 46, 47
Gore, Vice President Al, 37
Government Accounting Office, 107, 129
Government Management Reform Act of 1994, 31
Government Performance and Results Act of 1993, 31
Greene, SSG Kevin, 81
Griffith, General, 111
Guest House, 60
Gulf War, 4, 16, 47, 63, 67, 72, 75, 94, 98, 101, 103, 104, 129

H

Haiti, 98
Hansen Arts and Crafts Center, 43, 61
Hardin County, 49, 54, 55
Hardin County Planning Commission, 55
Harmeyer, MG General George H., 33, 66, 67
Hazardous Materials Center, 57
High Mobility Multi-Purpose Wheeled Vehicle, 68, 69, 98, 101, 127, 131
high performance unit, 21, 32
Highway 313, 55
Holder, Combined Arms Center Commander LTG, 100, 101
Horizontal Unit Displacement, 74
Hot Loop XXI, 22, 32
housing, 12, 36, 45, 46, 49, 55, 56, 84

I

Idaho, 74, 76, 78
Illinois, 44
Indiana, 43, 44, 46
Infantry, 69
Infantry Center, 81, 101
Information Age, 2, 11, 15, 16, 20, 22, 63, 64, 70, 90, 107, 108, 112, 114
information management, 23
information management officers, 23
Information Technology Management Reform Act, 110
Initial Entry Training, 74, 80
In-processing Module, 44

Inspector General, 30, 31
Installation Support Modules, 44
Institutional Army, 2, 12, 19, 30, 36, 63
Instructor Certification Program, 92
Instructor Training Course, 70
integrated concept team, 14, 112, 113, 119, 121, 125-127, 131
integrated product team, 14, 110
Integrated Training Area Management Program, 58, 84
Internet Information Services Management System, 93
Iraq, 8
Ireland Army Community Hospital, 55
Issues in Armor, 93
IVIS, 93, 117, 125

J

JANUS, 65, 75, 76, 77, 78, 95
John Macy Award, 32
Joint Venture, 2, 49, 63
Joint Vision 2010, 15, 107
Jones, Sam, 38
Jordan, MG Larry R., 86
Judge Advocate General, 45
Junior Reserve Officer Training Corps, 74

K

Kalb, COL John F., 121, 126
Kaminski, Under Secretary of Defense for Acquisition and Technology Paul G., 110
Keefe, Sandy, 45
Kentucky, 43, 44, 50, 55, 71
 Association for Marriage and Family Therapy, 47
 Cabinet for Economic Development, 43
 Department of Fish and Wildlife, 55
 Interservice Committee, 48
 Procurement Assistance Program, 43
 State Patrol, 55
 State Police, 55
Key Enabling Investment, 33
Kidd, Sergeant Major of the Army Richard, 47
Kuwait, 125
 Army, 117

L

Land Combat Support System, 43
landfill, 59
LAV-25, 127
Law Enforcement Career Day, 56
Law Enforcement Command, 43, 47, 56, 57
 Crime Prevention Division, 56
 MPI Section, 56
 Physical Security Division, 43
lead poisoning, 45, 46

Lenze, COL Paul, 65, 77
Leopard 2, 87
Light Infantry Division, 130
Lima Army Tank Plant, 114
local area network, 23, 44, 45
Long Nosed Bat, 82

M

M1, 68, 69, 79, 80, 114, 115, 125
M1/IPM1, 114
M1A1, 79, 80, 98, 115, 116, 125, 126
M1A2, 68, 69, 79, 80, 86, 87, 92, 112-119, 125, 126, 129, 130
 Follow on Test and Evaluation, 126
 System Enhancement Package, 112, 117-119, 125, 130
 Tank Commander Certification Course, 79
 Tank Driver Trainer, 79
 Test and Evaluation Master Plan (M1A2), 125
M2/M3A2 Bradley Fighting Vehicle, 68, 127
M3 Scout Commander Certification Course, 70
M4A4 Medium Tank, 85
M60, 114, 126
M88 recovery vehicle, 69
M113, 69, 85, 88, 127
M198, 98
M256 120-mm gun, 114, 119
M551A1 Sheridan, 111
M577, 129
M728 Combat Engineer Vehicle, 126
Maggart, MG Lon E., 16, 20-22, 26-30, 32-35, 36-38, 42-45, 47, 52, 54, 58-59, 65-67, 73, 76, 79, 83, 86, 90, 94, 95, 98, 101, 104, 112, 113, 120-122, 126, 127
MBT 70, 128
McAleer, Marion, 53
McCain, Senator John, 17
McFarland Oliver Range, 84
MCS/P, 100
MEDDAC, 30, 46, 47
Merkava, 126
Microsoft Exchange, 23
MILES, 81
military occupational specialty, 63, 78, 86, 87
Military History Education Program, 85
Military Intelligence, 69
Mississippi, 71
MLRS, 129
modernization, 2, 7, 11, 12, 13, 14-17, 19, 22-23, 33, 36, 42, 45, 83, 84, 85, 107-109, 111-114, 119, 127
Morale, Welfare, and Recreation, 37, 50, 59, 60
Mounted Battlespace Battle Lab, 121
Mounted Close Combat Battalion Concept, 130
Mounted Force, 64, 68, 84, 85, 91, 93, 94, 112, 127
Mounted Maneuver Battle Lab, 26, 90, 93, 121, 122, 130
 Science and Technology Division, 121, 122
Mounted Warfare Simulation Center, 93

Mounted Warfare Testbed, 122, 123
MOUT, 84, 85, 105
MOUT site, 85
Multiphasic Self Development program, 57

N

National Guard, 7, 69, 72, 73, 76, 77, 78, 79, 80
 division redesign, 72
 Enhanced Brigades, 76, 78
National Military Strategy, 71
National Performance Review, 12, 37
National Security Subcommittee of the House Appropriations Committee, 108
National Spouse Abuse Prevention Month, 47
National Training Center, 22, 66, 68, 69, 76, 78, 94, 95, 102, 125-127
Naval Ordnance Station, 51
Nethercutt, Representative George R., Jr. (R-WA), 108
NETT, 125
non-appropriated fund activities, 37, 38, 46, 60
Noncommissioned Officer Academy, 70, 71, 72, 81, 90
North Korea, 8
Notional End-State Subsystems, 37
nuclear, biological, and chemical weapons, 2, 129, 131

O

Office of the Secretary of Defense for Reserve Affairs, National Committee for Employer Support of the Guard and Reserve, 74
Office of the Special Assistant to the Commanding General, 73
Ohio, 43, 44
One Station Unit Training, 80
Operation Desert Storm, 114
Operation Joint Endeavor, 2, 43
Operations Other Than War, 11, 82, 98, 99, 100, 104, 114
Operation Restore Democracy, 98
Operational Test and Evaluation Command, 126
Otis, General (Ret.) Glenn, 112
Otter Creek Park, 47
Outreach Program, 49
OCONUS, 69
outsourcing, 11, 12, 14-15, 17, 42, 43, 109

P

Paladin, 98
Partners in Excellence, 54
Patton Museum of Cavalry and Armor, 85
Pennsylvania, 74, 130
Perry, Secretary of Defense William J., 36, 45
Personnel Locator, 44
Platoon Gunnery Trainer, 75
Pollution Prevention Act of 1990, 57
Pollution Prevention Plan, 57
POS/NAV, 129

Power Praise IV, 49
Pre-RIF Initiatives for Management and Employees, 50
Prevention of Sexual Harrasment, 54
Prichard Place, 46
Priest, Gary, 87
process action team, 32, 33, 36, 38, 42
PROFS, 23
Program Executive Office for Armored Systems Modernization, 112
Program Manager for Abrams Tank Systems, 125
Project Al-Qurain, 87
Project Sword, 87

Q

Quadrennial Defense Review, 2, 16, 18, 109
quality of life, 7, 12, 15-16, 19, 23, 32, 36, 45, 46, 57, 59, 60, 84, 108
Quality of Life Task Force, 45
Quality Workforce Board, 30-33, 36, 37, 38, 42, 91

R

Radcliff City Council, 49
Rand Corporation, 101, 127
range modernization, 83, 84
readiness, 8, 12, 15-17, 19, 23, 26, 45, 46, 47, 65, 77, 78, 90, 108
Reagan, President Ronald, 36
Reconnaissance-Pull, 102
Reconnaissance Symposium, 101, 103
Recycle Center, 49
Red Cheek Warbler, 82
Redstone Arsenal, 37
reengineering, 2, 12, 14-15, 18-19, 25-27, 29-33, 36, 37, 42, 51, 63, 64, 79
Region D, 71
Regional Corrections Facility, 43, 56
 Drug/Alcohol Treatment Program, 57
Reimer, General Dennis J., 15, 21, 111
reinvention, 19, 29
Reinvention Laboratory for Army XXI Acquisition Reform, 14
Research, Development and Acquisition, 11, 14, 109
Reserve Component, 8, 15, 17, 43, 47, 48, 49, 64, 65, 67, 69, 70, 71, 72, 73, 74, 75, 76, 79, 80, 81, 83
Reserve Officer Training Corps, 44, 74, 81
Resource Inventory and Conservation Plan, 58
Resource Management, 25-26, 32-33
Retirement Services Program, 44
Risk Reduction and Family Advocacy Program Committee, 47
Ritter, COL Patrick, 69, 79, 90, 94, 104
Roberts, Alyse, 30
Roberts, COL S.J.L., 101
Rocker II NCO Club, 61
Rose Terrace Water Park, 50, 60

S

Salt River Country Strategic Plan, 19-20, 31-32
Salt River Project, 29

Saudi Arabia, 47, 87, 40, 125
 Army, 116
 Scout Commander's Certification Course, 80
 Scout Platoon Leader Course, 80, 101
 Secretary of the Army, 108
 Secretary of Defense, 2, 11, 16, 36, 45, 57, 112
 Senate Armed Services Committee, 17, 113
 Senior Brigade Trainer, 102
 Senior Officers Logistics Management Course, 80
 Service Based Costing, 19, 25, 31, 42
 sexual harassment, 2, 17, 54
 SIDPERS-3, 15
 SIMNET, 68, 69, 75, 76, 77, 95, 98
 Simulation, Training and Instrumentation Command, 68, 69
 Simulations in Advanced Training Readiness, 76, 77, 78, 79, 92
 SIMUTA-B, 77
 SINCGARS, 117
 Single Fund, 60, 61
 Soviet Army, 90, 100
 Soviet Union, 2, 90, 109
 Spouse Appreciation Week, 47
 Staly, LTC W.D., 30
 ST 71-1-1, Tactics, Techniques, and Procedures for the Digitized Company Team, 95
 ST 71-2-2 (Revised Draft), Tactics, Techniques, and Procedures for the Digitized Battalion Task Force, 95
 ST 71-3, 95
 ST 71-3, Tactics, Techniques, and Procedures for the Digitized Brigade, 95
 St. Vith Range, 84
 Staff Chaplain's Office, 46, 47
 Staff Judge Advocate, 44, 45, 54-57
 Standard Installation/Division Personnel System, 44
 Steeles Range, 84
 Stilwell, Donna, 53
 strategic plan, 19, 29
 Suicide Prevention Task Force, 52
 Sullivan, General Gordon R., 2, 29, 47
 Sweden, 87

T

T-72, 114
 T-84, 131
 T-90, 114
 Tactical Operations Center, 68
 tactics, techniques, and procedures, 66
 TAHO Club, 59
 Tailhook Scandal, 16
 Tait, MG Thomas H., 84
 Taiwan, 111
 Tank Automotive and Armaments Command, 112
 Tank Commander Certification Course, 79
 Tank Extended Range Munition, 119, 130
 Tank Modernization Plan, 114, 116, 117, 119, 120, 125, 126
 Tank Table VIII, 78

- Tank Tables, 84
- Teen Builders, 49
- Tennessee, 71
- TF XXI, 95, 107
- Thunderbolt Lab, 31
- Title V Air Emissions Permit, 58
- Total Army, 38, 42, 64, 68, 71, 73, 77, 79
 - Analysis, 130
 - Analysis 2003, 72
 - Quality, 19, 21, 26, 28-30, 33, 38, 42
 - School System, 64, 71, 72, 92
 - Training System, 71, 72, 80, 81, 92
- Total Force, 72
- total quality management, 19, 29, 30-32
- townhall meetings, 22
- Toy Drive, 47
- Training and Doctrine Command, 7, 8, 12, 14, 19, 27, 29, 31-33, 42, 44, 46, 48-50, 52-54, 57-60, 62-66, 69, 70, 71, 72, 75, 78-82, 84-86, 92, 95, 99, 111, 121, 122, 128
 - Battle Lab Program, 122
 - environmental workgroup, 95
 - PAM 525-5: Force XXI Operations, 8, 90
 - Science and Technology program, 122
 - Warfighting Council, 121
- Transition Processing, 44
- Troop Issue Support Activities, 43
- TSM Abrams, 112, 125
- TSM XXI, 26
- Turkey, 87
- Twenty-Nine Palms, 125

U

- UDLP, 130
- UH-60 Blackhawk helicopter, 16
- Unit Conduct of Fire Trainer, 75, 76
- United Kingdom, 127
- United States, 4, 7, 8, 12, 16, 90
 - Air Force, 88
 - Army, 1, 2, 4, 7-8, 11-13, 14-17, 19, 23, 27-32, 34, 36, 37, 38, 42, 43, 44-50, 52, 54, 55, 60, 61, 63, 64-66, 68, 69, 70-75, 76-80, 81, 82, 84, 85, 87, 88, 92, 94, 107-109, 111
 - Armor Center, 19-23, 28-32, 34, 42, 43, 45, 46, 50, 51, 53, 55, 57-59, 61-63, 65-67, 69, 71, 73, 74, 76-79, 82, 84, 85-87, 90, 93, 95, 96, 100, 101, 112, 113, 121, 122, 128
 - Aviation Center, 101
 - Career and Alumni Program, 37, 50
 - Casualty Information Processing System, 44
 - Communities of Excellence, 29, 30-31, 36
 - Community Service Annual Training Seminar, 46
 - Community Theater, 59
 - Community Theater Program, 61
 - Continuing Education Services, 37
 - Family Housing, 45

Family Team Building, 12, 32, 47, 48, 49
 Ideas for Excellence Program, 32
 Intelligence Center, 101
 Materiel Command, 127
 Performance Improvement Criteria, 19,
 29, 30-31, 33, 42
 Recruiting Command, 44, 53
 Reinvention Center, 12
 Research Laboratory, 112
 Reserve Pay Office, 36
 Reserves, 72
 Science Board, 112, 113, 120, 126
 Units
 1st Armor Training
 Brigade, 74, 75,
 79, 80, 81, 82, 85, 86, 87
 5/15 Cavalry Squadron, 74
 13th Armor Regiment, 81
 2-13 Armor Battalion, 81
 1-46 Infantry Battalion, 74, 81
 2-46 Infantry Battalion, 74, 81
 81st Armor Regiment, 81
 1-81 Armor Battalion, 74, 79,
 81, 87
 2-81 Armor Battalion, 79, 81
 3-81 Armor Battalion, 80
 1st Cavalry Division, 125, 126
 2d Armored Cavalry Regiment, 98
 4th Infantry Division, 8, 95, 131
 8th Cavalry Regiment
 1/8 CAV, 125
 2/8 CAV, 125
 16th Cavalry Regiment, 26, 46, 76,
 77, 79, 80, 82, 85, 90, 125
 46th Adjutant General Battalion, 74,
 82
 48th Infantry Brigade, 78
 81st Reserve Support Command,
 43
 84th Training Division, 74
 116th Cavalry Brigade, 78
 194th Separate Armor Brigade, 43,
 59, 88
 2-274 Infantry Battalion, 74
 1/302 Cavalry Squadron, 74
 3/397 Cavalry Squadron, 74
 399th Reception Battalion, 75
 Virtual Brigade, 66
 Congress, 2, 8, 16-17, 36, 45, 46, 52, 59,
 60, 66, 77, 85, 112, 130
 Department of Agriculture Natural
 Resources Conservation Service, 58
 Marine Corps, 86, 101
 Navy, 16-17, 51, 88

Small Business Administration, 43
Supreme Court, 17
University of Louisville, 81
User-Jury, 67, 123
User Lab, 122, 123

V

Veach, COL Jerry L., 73, 76
Vehicle Integrated Defense System, 125
velocity management, 15
Vice Chief of Staff of the Army, 47
Vietnam War, 63, 85
Virtual Training Program, 65, 73, 75, 76, 77, 83
Voluntary Early Retirement Authority, 50
Voluntary Separation Incentive, 50, 51

W

Walker School, 49
War on Excess, 27
war on infrastructure, 33, 58
Warfighter XXI, 63
Warfighting Lens Analysis, 121, 122
Warfighting Rapid Acquisition Program, 14
WARNET XXI, 63
Warrior XXI, 63, 64, 65, 66, 69, 70, 71, 75, 79
Wastewater Treatment Plant, 57
West, Secretary of the Army Togo D., Jr., 12, 45, 72
West Virginia, 44
Whole Neighborhood Renewal project, 46
Wilcox Project, 84
Wilcox Range, 84
Wisconsin, 74

X

XM 291, 119, 126
XM 943 Smart Target-Activated Fire and
Forget round, 119, 126

Y

Yano Multi-Purpose Range Complex, 56, 84
Youth at Risk Seminar Camp, 47